Independent, Third Party Review of the Solid Waste Transfer and Waste Export System Plan

for

King County Council
Washington

Submitted by:

GBB
SOLID WASTE MANAGEMENT CONSULTANTS

GERSHMAN, BRICKNER & BRATTON, INC.
8550 Arlington Boulevard, Suite 203
Fairfax, Virginia 22031
800-573-5801

In Association with:

MSWCONSULTANTS

Final Report
July 31, 2007
## Table of Contents

1. Cameo Summary for Action Steps.................................................................................................................. ii
2. Executive Summary ........................................................................................................................................... ES-1
3. I. Introduction.................................................................................................................................................. 1
   A. The Assignment........................................................................................................................................ 1
   B. Background............................................................................................................................................... 1
4. II. Answers to the Questions for Independent, Third-Party Review............................................................... 3
   Analysis of Projections, Question 1.................................................................................................................. 3
   Public Process, Question 2............................................................................................................................ 6
   Transfer Stations Issues and Assumptions, Question 3.................................................................................. 7
   Transfer Stations Issues and Assumptions, Question 4................................................................................ 9
   Transfer Stations Issues and Assumptions, Question 5............................................................................... 12
   Transfer Stations Issues and Assumptions, Question 6............................................................................. 16
   Transfer Stations Issues and Assumptions, Question 7............................................................................ 18
   Waste to Energy, Question 8....................................................................................................................... 20
   Financial Assumptions, Question 9. ............................................................................................................. 22
   Sustainability, Question 10. ......................................................................................................................... 24
5. III. Commentary.............................................................................................................................................. 26
6. IV. Appendices
   A. Review Methodology and Expert Panel ...................................................................................................... A-1
   B. Organizational Chart, Expert Firms and Experts' Résumés...................................................................... B-1
   C. GBB Team Questions and Additional Analysis Requests, County Response, and
      Additional Documents Provided and Reviewed ....................................................................................... C-1
CAMEO SUMMARY FOR ACTION STEPS

1. Transfer Station:
   - Transfer Stations Need To Be Upgraded With Improved Recycling Options
   - Transfer Stations Should Be Called Materials Resource Centers
   - Transfer Cost Projections Appear Excessive And Should Be Reviewed
   - Increased Recycling Goals Would Not Alter Number Of Transfer Stations
   - Transfer Stations Should Become Community Assets And Be A Focal Point For Increased Diversion And Environmental Education

2. Clean And Green:
   - Plan Calls For Increased Recycling But Does Not Explain Programs To Achieve The Goal. Programs Must Be Defined
   - Transfer Stations Should Provide Full Recycling, Reuse, And Household Hazardous Waste Options
   - All Messages (Signs, Brochures) And Personnel At Transfer Stations Should Have Coordinated Environmental Message

3. Cedar Hills Landfill:
   - Reduce Size Of Buffer To State Regulation Requirement
   - Build Walls To Extend Life Of Cedar Hills Landfill

4. Intermodal:
   - Intermodal Strategy Should Be To Have Access To BNSF & UP
   - King County Should Export More Waste And Do It Earlier Than Stated In The Export Plan Schedule
   - King County Must Strategically Separate Disposal From Rail Transport In Procurement

5. Management:
   - Full Cost Management Study Should Be Performed On Solid Waste Division's Operations
   - Activity Cost Management Should Be Implemented
Executive Summary

The consulting team of Gershman, Brickner & Bratton, Inc. (“GBB”), MSW Consultants, and R.L. Banks & Associates, Inc. (collectively, the “GBB Team”) was selected to provide the independent, third-party review of King County’s Solid Waste Transfer and Waste Export System Plan.

This Report presents the findings of the GBB Team and response to specific questions and issues listed in the RFP. The review methodology, tasks, and panel of experts participating in the review are shown in Appendices A and B. The GBB Team’s questions and additional analyses request to King County upon review of the various planning documents and King County’s response to those questions and the additional documents that were provided by King County and reviewed by the GBB Team are set forth in Appendix C.

The following two tables provide a summary of the answers by the GBB Team to King County’s questions and the commentary the GBB Team has provided to King County.
<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>ANSWERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q1: Projections of waste, recycling, and reduction and how they relate</strong></td>
<td>• Waste and population projections appear sound&lt;br&gt;• Recycling projection for additional diversion has little to no support&lt;br&gt;• Transfer stations need to be upgraded with improved recycling options&lt;br&gt;• Intermodal is best strategy but site should have access to BNSF &amp; UP for greatest market advantage</td>
</tr>
<tr>
<td>to transfer stations, intermodal system, and recycling, processing**</td>
<td></td>
</tr>
<tr>
<td>infrastructure.</td>
<td></td>
</tr>
<tr>
<td><strong>Q2: Are there other methods</strong></td>
<td>• Solid Waste Division implemented a thorough public/stakeholder process&lt;br&gt;• Process for siting followed best practices&lt;br&gt;• County should develop professional education program using Enumclaw’s transfer station as a model</td>
</tr>
<tr>
<td>that would enhance public/stakeholders’ participation in the facility**</td>
<td></td>
</tr>
<tr>
<td>siting process?</td>
<td></td>
</tr>
<tr>
<td><strong>Q3: Would varying the recycling assumptions alter the number or</strong></td>
<td>• Recycling assumptions in County’s plan are not a major driver&lt;br&gt;• Increased recycling goals would not alter number of transfer stations but their configuration so as to improve recycling options</td>
</tr>
<tr>
<td>configuration of planned transfer facilities?</td>
<td></td>
</tr>
<tr>
<td><strong>Q4: Should future publicly owned/operated facilities have space for</strong></td>
<td>• Absolutely&lt;br&gt;• Transfer stations should become community assets and be a focal point for increased diversion and environmental education</td>
</tr>
<tr>
<td>extended recycling activities?</td>
<td></td>
</tr>
<tr>
<td><strong>Q5: Do the number and location of transfer stations recommended in the</strong></td>
<td>• Network of transfer stations is good approach&lt;br&gt;• Capital cost projections for transfer stations appear excessive; additional value engineering is suggested to lower costs&lt;br&gt;• Meaningful demographic projections were accounted for by Solid Waste Division</td>
</tr>
<tr>
<td>Waste Export System Plan seem appropriate for King County?**</td>
<td></td>
</tr>
<tr>
<td>What changes in demographics could affect the system as configured?**</td>
<td></td>
</tr>
<tr>
<td>Are capital cost estimates in the Plan reasonable?**</td>
<td></td>
</tr>
</tbody>
</table>
| Q6: What are alternative options for providing compensation to host cities, such as, but not limited to, one time payments, payments based on tonnage, payments based on traffic, payments based on lost revenue? To what do we benchmark host city compensation payments – for example, lost revenue from utility tax or property tax? | • Host fees between $1/ton and $5/ton are industry norm  
• Host communities receive benefit by having facility in these jurisdictions such as reducing commercial hauler transport time which keep collection rates to customers down |
|---|---|
| Q7: Should self-haul service be provided and, if so, at what levels and how should the cost be covered? | • Self-haul service should be provided  
• Transaction based fee (rather than per ton) should be implemented  
• Jurisdictions should implement bulky waste curbside collection programs to reduce self-haul at transfer stations |
| Q8: Understanding that analysis of WTE will take place in the Comp Plan update process – how might including WTE technologies in King County’s solid waste strategy affect transfer station or waste export plan recommendations? | • A single 3,000 tons per day WTE feasibility will not change plan for multiple transfer stations  
• Smaller and multiple WTE facilities placed around the County will eliminate need for one or more transfer stations |
| Q9: Review County’s economic analysis and assumptions in sensitivity analysis for early waste export and waste withdrawal. | • Rate model and long-term cost projections are thorough  
• Early waste export plan assumptions are reasonable  
• Recommend that County analyzes exporting more waste on an earlier time table and in conjunction with other local governments, especially the City of Seattle |
| Q10: Are there models or methods for the transfer of solid waste from the point of generation to final disposal that minimize fossil fuel consumption and air pollution? | • Implement clean fuel fueling infrastructure  
• Legislate that private haulers use cleaner fuel |
<table>
<thead>
<tr>
<th>TOPICS OF COMMENTARY</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cedar Hills Landfill</td>
<td>• Cedar Hills Landfill is a well supervised and operated facility</td>
</tr>
<tr>
<td></td>
<td>• Reduce size of buffer to be closer to that required by state regulations and use space gained to maximize disposal capacity;</td>
</tr>
<tr>
<td></td>
<td>• Prolong the life of the landfill by building walls to make more space for disposal</td>
</tr>
<tr>
<td></td>
<td>• Disposal capacity for natural disasters should not be a consideration in whether to export waste</td>
</tr>
<tr>
<td>Clean and Green</td>
<td>• Plan calls for increased recycling but does not explain programs to achieve this</td>
</tr>
<tr>
<td></td>
<td>• Transfer stations should have full recycling, reuse, and household hazardous waste options. Names of the facilities should reflect emphasis on recycling not disposal</td>
</tr>
<tr>
<td></td>
<td>• A coordinated education plan involving all messages, signs, brochures should be developed; personnel at these centers should be trained to promote diversion and educate customers on environmentally progressive management</td>
</tr>
<tr>
<td></td>
<td>• County should evaluate options for materials recovery facility to include all recyclables generated by the County and its member jurisdictions</td>
</tr>
<tr>
<td>Intermodal Issues</td>
<td>• King County should export waste early and in quantities that best comply with number of rail carriages rather than an arbitrary volume percent</td>
</tr>
<tr>
<td></td>
<td>• King County must strategically separate disposal from rail transport in procurement</td>
</tr>
<tr>
<td></td>
<td>• Rail haul distance of waste is short, revenues modest; railroads reluctant to make long term contract</td>
</tr>
</tbody>
</table>
I. Introduction

A. The Assignment

In conjunction with its component cities, King County is planning to implement solid waste export once its existing landfill reaches maximum capacity, anticipated as soon as 2015-2016. In 2006, King County, pursuant to Ordinance 2006-0263, issued a Request for Proposals (“RFP”) for an independent, third-party review of critical issues and assumptions regarding waste export identified by various stakeholder members of the federated regional waste management system. The RFP included a listing of questions and issues that were to be addressed following a thorough review of the planning documents for the waste export plan.

Ordinance 2006-0263 provides that the process for such independent, third-party review shall include outreach from key stakeholders, including, at a minimum, the Solid Waste Advisory Committee (“SWAC”), the Metropolitan Waste Management Advisory Committee (“MWMAC”), and the Interjurisdictional Technical Staff Group (“ITSG”), as questions are developed for the third-party, independent review.

The consulting team of Gershman, Brickner & Bratton, Inc. (“GBB”), MSW Consultants, and R.L. Banks & Associates, Inc. (collectively the “GBB Team”) was selected to provide the independent, third-party review. In addition, there were two reviewers from local government – a representative from San Bernardino County, California, and a representative from the Sanitation Districts of Los Angeles County, California.

This Report presents the findings of the GBB Team and response to specific questions and issues listed in the RFP. King County’s Project Manager is coordinating the work of the local government reviewers and their comments will be placed into this document by GBB upon receipt from King County. The review methodology, tasks, and panel of experts participating in the review are shown in Appendix A. The GBB Team’s questions and additional analyses request to King County upon review of the various planning documents and King County’s response to those questions and the additional documents that were provided by King County and reviewed by the GBB Team are set forth in Appendix B.

B. Background

King County manages the disposal of waste streams from the unincorporated areas of the County and for 37 suburban cities in the County, excluding the City of Seattle, through Interlocal Agreements. In the past, some of the suburban cities believed that the system could be managed more efficiently, and that rates were at higher levels than they should be, and they challenged the validity of the Interlocal Agreements. However, with the significant unincorporated areas in the County, the County has been able to demonstrate economies of scale in offering its services and thus has been able to keep the suburban cities as part of the County system.

In the early 1960s, the transfer system put in place by King County was visionary. From the presidency of John F. Kennedy to that of George H. Bush, no significant changes to those facilities have been made. During the GBB Team’s field visit, it became apparent that this once progressive infrastructure requires significant updating and/or total replacement at certain sites. In addition, the self-haul milieu and free recycling structure need to be raised to a higher level, and the flow of traffic changed to take into account the increase in traffic and population over the last 40 years. Further, the County has grown in a manner that certain of the current sites are
no longer strategically located. Some are in congested areas, and some are now in residential areas. A key issue regarding the transfer infrastructure is that most of the facilities lack the space needed to accommodate diversion and special waste programs at the levels that are necessary to be consistent with best practices and expanded functions important for the transfer stations of the future, including accommodating the volume of self-haulers that use the County transfer stations.

The County’s tipping fee is competitive when compared to neighboring jurisdictions but relatively high when compared with other areas along the west coast. *Can the future system maintain that?* *Will the member cities stay in the system with the revenue requirement to implement the waste export plan included?* These questions become critical in system planning and in considering the revenue effect on the County for the future system needs. The Interlocal Agreements will require term extension to cover the future system the County needs to move toward.

There has been limited local interest to investigate waste-to-energy (“WTE”) and thermal processing options. Governments and authorities currently served by WTE are generally looking to continue using those facilities as the economic and environmental performance has been superlative since retrofits have been made as required by the Amendments to the Clean Air Act (“CAA”) of 1998. There are some locations (e.g. Lee County, FL; Pinellas County, FL; Hillsborough County, FL) that are expanding their WTE facilities; a few others are planning expansion; while certain other localities are considering implementing new WTE capacity (e.g. Frederick County, MD; Harford County, MD; Palm Beach County, FL). On the other hand, there have also been a few communities which have opted to close WTE facilities over the past several years because they didn’t want to retrofit for CAA Amendments or they had inefficient and non-compliant facilities, e.g. Nashville, TN. The ones left demonstrate good performance records and environmental protection controls. WTE is revitalizing itself now with recent experience and our nation’s current re-focus on the need for alternative/renewable energy sources.

Nonetheless, new WTE Facilities will be difficult to site, and will raise public fears of their environmental performance, require significant capital to construct, and be expensive to operate. However, with the growing positive environmental performance record of WTE, confirmed by the U.S. Environmental Protection Agency, and the re-focus of our nation on critical energy needs, there appears to be greater reconsideration of WTE as a disposal option that brings local sustainable disposal capacity and an energy source within the region it is placed. The timeframe to plan, implement, and place in operations a WTE facility is significant, in the five to seven-year range or even greater. So, if this option is to be considered seriously for implementation, the planning and development timelines need to be determined as soon as possible.

The suburban cities previously expressed significant concerns about what King County implements for its future processing and disposal infrastructure. It will not be easy to site any new solid waste management infrastructure. It is likely to be easier to make use of existing locations where solid waste management services are currently provided, and expand and improve the functions and integrity of the facilities and services at those locations.

The GBB Team believes the findings, responses to questions, and other commentary and observations presented in this Report will be helpful to King County and the stakeholder members of the regional waste management system as they further consider their options and chart their course for a future solid waste management system that will meet their needs.
II. Answers to the Questions for Independent, Third-Party Review

The GBB Team has provided its answers in a format for the reader’s quick assessment. First, the category and question are presented, followed by the answers in the following format:

**CAMEO ANSWER:** a brief summary of the full answer.

**FULL ANSWER:** a more complete answer.

Analysis of Projections, Question 1.

Analyze waste generation, population and waste reduction and recycling projections and their related impact to sizing transfer system, intermodal system and regional recycling processing infrastructure.

**CAMEO ANSWER:**

- The methodology used to analyze waste generation and population demographics followed best practices and was thorough.
- The higher the anticipated volume projections, the more competitive the rail mode is going to be relative to motor carriage. Therefore, the need to plan and subsequently design an intermodal terminal of sufficient size to meet the highest projected volume needs of King County, ideally including that generated by the City of Seattle, through the end of this century, as well as related on-site container/trailer storage as necessary to support that growth, is paramount.
- Ideally, the intermodal facility site will enjoy equal access (same costs incurred and operating efficiencies achieved) by Burlington Northern Santa Fe (BNSF) and Union Pacific (UP).
- Otherwise, long-term trends favoring the economics of freight railroading as compared with over-the-road trucking to distant landfills will limit the competitive options available to King County and tend to fill available and future rail capacity with other traffic, which will result in both higher costs and poorer service.
- Due to the limited acreage on the Harbor Island site or potential alternative sites, the potential disadvantages of co-locating a transfer station as well as an intermodal terminal on the same site should be weighed very carefully, unless weight restrictions or other considerations require compacting or further compacting of containerized waste on the site of the intermodal terminal in order to maximize the efficiency of long haul transportation.
- Both ever increasing demands on the capacity of the major BNSF and UP rail lines in the subject region and railroad economics will require King County to focus on an intermodal system operating plan designed around the most efficient train operations (i.e., based around the train length and weight deemed optimal by the handling railroad(s)), not just the number of containers that equate to the average, post-recycling MSW tonnage generated daily, divided by the average tons that can be compacted into a container.
• The GBB Team would urge King County to hold onto the Harbor Island site, or any similarly situated site obtained in exchange for that site, even if it is not needed to support the Early Export option under consideration or even the full export scenario which will accompany the closing or substantial cutback of operations at Cedar Hills Landfill. This is provided that it is equally accessible to both major railroads and is of sufficient length and width to support modern railroad freight commercial and operating practices. Such a site will only become harder and harder to develop over time. It also may be appropriate to acquire nearby, off-site, trailer storage if the Harbor Island or replacement site looks to be constrained as soon as significant waste flows begin to be diverted from Cedar Hills.

• The Solid Waste Division provided professional evaluations of waste generation and population growth, which impact the sizing of the regional transfer system.

FULL ANSWER:

Waste generation, population and waste reduction and recycling projections and their related impact to sizing transfer system:

A review of Appendix C to the Fourth Milestone Report #4 and other documents with waste projections for individual transfer stations indicates that the appropriate variables were utilized as input to the projection model. The results for the baseline projection look reasonable given the assumptions, such as the CDL ban and diversion levels. The model, however, was not provided in the documents so no conclusions as to the algorithms used were drawn.

The Waste Export Plan and supporting documents discuss increasing recycling as a goal and in the projections, additional recycling is forecasted to keep the waste disposal requirement at approximately one million tons per year. While the GBB Project Team embraces the goal of increasing the jurisdiction’s recycling from 43 to 60 percent and saw it in line with other large west coast jurisdictions such as Metro Portland and San Francisco, the Team is disappointed at the report’s absence of serious attention to details on how the County and the jurisdictions within the County would meet its new goal. Measures which would achieve the increased recycling include:

1. Mandatory curbside recycling collection requirements with specified materials promulgated in all cooperating cities and in the unincorporated areas of the County;
2. New and improved transfer stations should represent new and improved materials management. They should be built to improve and expand recycling and reuse options (Enumclaw appears to be a model for this);
3. The County is about to change its solid waste infrastructure for the first time in 40 years. It should take this time to develop a new integrated environmental education strategy to simultaneously roll out with this new infrastructure. This education policy should focus on moving King County to a Cleaner and Greener environment;
4. Differential pricing by materials offered to self-haulers to promote and enhance separate depositing of materials such as yard waste, clean wood, masonry, dirt, etc.;
5. Increased requirements for recycling at commercial, institutional, and governmental establishments and the haulers that serve them; and
6. Implementation of a recycling and disposal plan requirement on all construction and demolition projects at the permit stage that includes a mandatory recycling level, reporting at the project end, and performance bonds.
The number and locations of the transfer stations in the Plan appear adequate to meet the receiving and transfer requirements even if the 60 percent recycling is not met, provided the size and design of the individual transfer stations is sufficient to handle the waste quantities projected and the resulting traffic as described. The new facility at Enumclaw and the proposed design for Bow Lake provide sufficient functionality. An increase in the recycling capability and/or reduction of self-haul will provide assurance for meeting the capacity requirements.

**Intermodal:**

Staff’s consideration of the Early Export program and intermodal transportation, as well as the purchase of a potential intermodal terminal site, make eminent sense for a variety of reasons:

1. Develops experience with such a system so as to work out bugs in advance of the onslaught of higher volumes associated with the phasing out of Cedar Hills Landfill as a final disposal point;
2. Phases in the higher costs and related charges to customers associated with exporting waste; and
3. Preserves Cedar Hills as an emergency destination to which at least King County’s waste can be sent, among other reasons.

Provided that an operationally efficient and financially driven plan can be developed, procured and executed, rail transportation is likely to be not only the most cost-effective transportation solution but also the most environmentally friendly. In addition, it should yield the effect of diverting tens of thousands of trucks a year from Washington State highways, for which capacity will become more important as the population in Puget Sound continues to surge.

The GBB Team notes four concerns for King County policy makers to keep in mind as the County moves forward implementing its long-term Waste Export plan:

1. The most efficient waste handling system would incorporate direct loading of waste and compaction at each transfer station so that the loaded containers could be driven directly to an intermodal facility, thereby minimizing the number of activities performed, and minimizing the space needed, at the intermodal site. Given the difficulty of siting and expanding transfer stations in King County, there is concern that the Solid Waste Division may not have the space to operate fully loaded (compacted) intermodal containers between all of its current and planned transfer stations and the intermodal terminal facility site;
2. The adequacy of the Harbor Island site or an alternative site is a concern. Although King County should be commended for securing a site for intermodal activity, the GBB Team’s concern is focused on whether the length and shape of the site lend themselves to efficient railroad operations. That concern would be amplified were the site also to host a transfer station and/or a compaction function in addition to the on-site container and chassis parking, which is part and parcel of a well planned, modern, intermodal terminal;
3. The GBB Team is concerned about the potentially higher operating costs and amortized capital costs associated with the Division’s construction and operation (direct or contracted) of a dedicated intermodal facility for such a limited number of trains. Division representatives should continue to discuss with officials at BNSF and UP whether those carriers would consider handling, both in the early and long run, the County’s waste in their intermodal yards. Those
carriers would be less inclined to handle King County’s waste if such handling resulted in the occupation of precious space within the existing railroad intermodal terminals. With the short rail time, rail carriers will see modest revenues from trash clients thereby diminishing their incentive to use up any of their needed space; and

4. It does not make much sense that King County and Seattle separately would acquire, permit, develop and utilize intermodal terminals dedicated only to the handling of their respective waste streams. In terms of rail hauling, King County is not a large customer. The tonnage provided by the Division amounts only to one loaded waste train every other day. An intermodal facility dedicated to servicing only King County would be vastly underutilized. Combining King County’s tonnage with that of the City of Seattle’s makes eminent sense. The carrying/financing costs of permitting and constructing an intermodal site and of the cranes and other equipment necessary to operate it efficiently are so significant as to invite cost sharing. King County should enter into discussions with the City of Seattle to save money for each jurisdiction.

Even if institutional barriers prove too great to combine the waste streams of both jurisdictions completely, County staff would be well served to consider mixing at least some of the waste stream it controls with that handled by Seattle because it will be in the interests of both jurisdictions to combine at least some of their waste as volumes increase to the point of driving the need to operate additional trains. The distance between King County and the nearest rail-served landfills is sufficiently short as to cause UP and BNSF to focus on the revenue/contribution per train, not per car or per ton. That focus will penalize any waste generator that has to tender volumes equating to less than maximum sized trains. Hence, the mixing of volumes between agencies will assume an importance that will loom large if not recognized and planned for before export commencement.

Public Process, Question 2.

Are there other methods that would enhance public/stakeholders’ participation in the facility siting process?

CAMEO ANSWER:

• King County’s Solid Waste Division performed a thorough and professional process to involve and enhance public and stakeholder participation in the development of this long-term Waste Export Plan.

• The preliminary siting process for the Transfer Stations followed best practices.

• The County should develop a professional education program utilizing Enumclaw’s Transfer Station as a model.

FULL ANSWER:

The public process to date appears extensive and thorough in its expenditure of time and resources. The siting process appears to follow best practices. Significant data have been assembled on alternatives. A continuing campaign to present the data and the process appears to be in place to be carried out and should be maintained. However, specific site selection has not yet begun and when the review begins on a specific selected site, participation will increase and
very often turns negative. The Plan, in presenting alternatives that close specific transfer station sites, recognizes the problem with some of the existing sites; replacing them will be an arduous task.

Because of the time involved in public transfer station siting, the GBB Team recommends that the County start immediately on key site replacement. We would suggest that Houghton is the place to start.

Having a successful model to show is worth a thousand studies. King County’s most modern transfer station and convenience center is the one located in Enumclaw; if this is to be the model that is replicated at other locations in the County, we would suggest adding tours of this facility to interested stakeholders. In addition, we suggest developing and airing public sector television programs to familiarize the general public with the need, function and aesthetics of the new facilities. The overall thrust of these infomercials would be providing haulers and self-haulers an appropriate place to bring their waste and recyclables, helping achieve a higher County diversion goal to preserve Cedar Hills Landfill and keep a lid on solid waste management costs.

King County has pursued an extensive and thorough public process that follows best practices in the development of the Solid Waste Transfer and Export System Plan. As noted above, specific sites have not been advanced to the public. When siting a solid waste facility, a jurisdiction must go above and beyond these best practices, however, in order to secure acceptance. Therefore, we suggest developing and implementing an education campaign that describes where King County wants to go with its waste management. This should be a theme that is easily recognizable and logical. The theme will provide a uniform message in its brochures, infomercials on public sector television programs, in public addresses by elected officials, in its signage at all facilities and on transfer trailers, and in all other public information on the system. The private companies that provide solid waste services and benefit from the County system should participate in a positive manner as well.

Transfer Stations Issues and Assumptions, Question 3

Would varying the recycling assumptions alter the number or configuration of planned transfer facilities?

CAMEO ANSWER:

- The current King County recycling rate is 43 percent. Additional increases in diversion will be harder to come by because the ‘low-hanging recycling fruit’ has already been picked. The current plans to increase efficiencies and capacity of the system are warranted.

- The recycling assumptions do not appear to be a major driver of the number and configuration of the network of facilities, although quite possibly there are alternative configurations and differential tipping fees for certain materials at each facility that would improve diversion of self-hauled wastes.
There are actually two components to this question that should be addressed separately. The first component to the question is essentially whether or not increases (or decreases) in recycled material quantities would have an impact on the overall number of transfer stations. For example, if diversion could be increased enough, perhaps it would be possible to close one or more facilities or to delay expanding existing facilities for a longer period of time. The second component to the question is whether or not the individual facility configurations should be changed to improve recycling at the point of deposition. These questions are answered in turn below.

**Impact on Number of Planned Facilities**

With a network of eight transfer facilities and two rural drop boxes for a County of 2,100 square miles and a population of 1.8 million, that is projected to keep growing at the rate of 1.5 percent per year, it appears that there is a sufficient number of transfer facilities in the County to handle waste and reuse/recyclables receiving needs.

While the equation for sizing each facility will be influenced by on-site recycling/sorting activities, the County has developed extensive criteria beyond recycling diversion for determining the adequacy of existing transfer facilities. With a recycling rate of 43 percent and a goal of increasing to 60 percent by 2016, the Solid Waste Transfer and Export System Plan is being developed with the expectation to maintain and increase recycling, and it is our opinion that the range of other facility evaluation criteria developed will outweigh the recycling diversion in determining the number of facilities. Jurisdictions currently committed to the Zero Waste concept, such as the Canadian City Toronto and California's San Bernardino County, maintain a solid waste infrastructure to handle and dispose of waste while their communities strive to pick the ever higher and problematic recycling “fruit.” To reach the 60 percent and higher recycling goal, it will be necessary to provide space within the network of transfer stations to enable commingled loads to be separated in order to maximize recycling. This creates the potentially counterintuitive conclusion that heightened recycling, while reducing the amount of wastes requiring disposal, does not translate into a reduction in the size of the transfer infrastructure. Rather, the transfer infrastructure size stays relatively level, but the outflow of material from the transfer stations shifts from predominantly wastes to be disposed to re-usable and recyclable materials sent to processors and others.

**Impact on Facility Configurations**

A review of the Second and Fourth Milestone Reports and the Solid Waste Transfer and Export System Plan reveals that the County has extensively reviewed its transfer station requirements and has accurately identified the need for major facility upgrades. The GBB Team visited most of the transfer stations, and these observations confirm that additional recycling activities are restricted by the current layouts and site size of the existing transfer stations. In short, these legacy King County transfer stations are not designed to accommodate additional recycling of residentially or commercially-generated recyclables or additional CDL or self-haul recycling.

The County has set a goal to increase the current recycling rate of 43 percent to 60 percent, to be achieved primarily by adding food waste to the current curbside organics collection. The removal of an additional 17 percent of the waste stream from passing through this network of transfer stations will alleviate some of the pressure that is currently on this system (it was beyond
the scope of the GBB Team’s analysis to evaluate the elements of the expanded organics collection and composting that will be required). However, the material brought by the self-haulers was observed to provide potential for additional recycling.

Given the high number of self-haulers who deliver wastes to the transfer stations, and given space constraints at the existing facilities, there is merit to the notion that the upgraded system should accommodate the self-haulers in such a way as to provide incentives for more recycling and/or separation of wastes at the transfer stations. Our on-site observations identified meaningful quantities of yard waste and C&D debris delivered by the self-haul generators — materials that could be diverted if sufficient space and processing capacity were available. We note that many transfer stations, especially in the western U.S., have evolved to have processing and separation capability for various generator sectors, and that such reconfiguration of some or all of the King County facilities should be taken into consideration.

The current network of existing and planned upgraded facilities appears to be reasonable to handle the projected volume of wastes and recyclables generated within the County system. Further, all indications are that King County residents would embrace additional recycling programs and recycling opportunities within the network of transfer stations were such programs offered in a consistent and convenient manner.

The following considerations are related to the question of having a reasonable number of appropriately configured transfer stations:

Collection System Enhancement: We note that increasing diversion to 60 percent through food waste and organics diversion will require additional collection resources as well as sufficient compost facility capacity and access to manage these materials. It was beyond the scope of our analysis to assess the adequacy of planned collection system enhancements and compost facility development.

Local Environmental Impacts: King County’s commitment to recycling reflects high environmental stewardship, and landfilled quantities have been minimized from the County’s waste stream. Although outside the scope of our analysis to consider the composting or other management of incrementally diverted food wastes and other new organics, we note that these organic wastes are more susceptible to problems with odors and vectors during both collection and processing.

Transfer Stations Issues and Assumptions, Question 4.

CAMEO ANSWER:

• Absolutely. While separate collection programs make sense for the traditional residential sector and for much of the commercial sector, given the high degree of usage of the King County facilities by self-haulers (presumably both residential and commercial/contractor) it appears that the new transfer stations should have additional space and/or processing capabilities to handle incremental diversion for some waste streams.
• Perhaps, if residents perceived that there was meaningful recycling occurring at these facilities beyond pure transfer of wastes, there could also be a side benefit of improving public acceptance of their locations and/or support for any expansion. Even something as simple as renaming them as “recycling and transfer facilities” or “materials resource centers” may be warranted to spread the word that the facilities serve as more than just waste handling facilities and that waste reduction and recycling is also occurring within the facility.

FULL ANSWER:

King County has decided not to site new landfills in the County, and siting new transfer stations appears problematic for King County. In light of these dynamics, increasing opportunities at transfer stations to recycle and divert material is appropriate and recommended.

Recycling activities currently, and for the foreseeable future, will continue to be driven by the separate collection programs that exist for residents and businesses. Residential curbside recycling, commercial recycling, appliance pick-up, separate yard waste collection, and C&D debris source separation and processing will continue to drive recycling as a whole in King County. However, from the documentation provided, it appears there are still opportunities for diversion at the point of deposition – i.e., for smaller self-haulers that deliver mixed loads that contain significant quantities of recyclables along with wastes to the transfer stations.

As an example of the benefits of providing for incremental recycling within the transfer station network, self-haulers were reported to have disposed of 226,000 tons in 2005 – roughly one quarter of the disposed waste stream. A significant fraction of self-haul wastes is clearly divertible – especially yard waste, mixed scrap metals, and “other waste” which is most likely C&D debris to a large extent. The prevalence of these recyclable materials in the self-haul waste stream was evident during our site visits. Table 5 below depicts the potential incremental recycling assuming 25 and 50 percent diversion of the aforementioned materials from the self-haul waste stream, using facility-centric separation and transfer.
### Table 5. Recycling Diversion Rates

<table>
<thead>
<tr>
<th>Components of Self-Haul Waste Stream</th>
<th>Total Tons Disposed</th>
<th>Recovered Tons at 25% Diversion</th>
<th>Recovered Tons at 50% Diversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yard Waste</td>
<td>27,120</td>
<td>6,780</td>
<td>13,560</td>
</tr>
<tr>
<td>Mixed Metals</td>
<td>92,660</td>
<td>23,165</td>
<td>46,330</td>
</tr>
<tr>
<td>&quot;Other Waste&quot; (C&amp;D)</td>
<td>20,340</td>
<td>5,085</td>
<td>10,170</td>
</tr>
<tr>
<td>Total</td>
<td>140,120</td>
<td>35,030</td>
<td>70,060</td>
</tr>
</tbody>
</table>

Incremental County Recycling Rate Increase: +2% +4%

Note: This table is strictly for purposes of illustrating the potential for using the transfer facility network for incremental diversion, and it was beyond our scope to validate the estimates for any specific facility. However, if given the choice between implementing incremental collection resources and programs to reduce the number of self-haulers and provide for improved recycling by self-haulers at central locations such as the transfer stations, it appears likely that greater system efficiency would be achieved by utilizing the transfer facility network for this purpose.

We note that many, primarily western, U.S. transfer stations — and especially those in California — integrate separation and processing of a wide range of recyclables as an integral purpose of the facility. California integrated waste management systems may serve as a good model for King County, insofar as solid waste facilities have evolved in an environment where there is a strong catalyst for change (AB 939 legislation) and aggressive “NIMBY”-ism. While we hesitate to make sweeping generalizations and would note that every system is different in some regards, it is reasonable to note that most transfer stations, and even some landfills, in California, have grown from an existing transfer station site (rather than sited anew) and have come to include offload areas for vegetative wastes, CDL, appliances/scrap metals, and other recoverable streams. This model would appear to be similar to the direction King County is moving.

The potential downside to integrating extended recycling activities into the existing facilities is that expanding or re-configuring some of the facilities with sufficient space and access for incremental separation and recycling could increase, in some cases significantly, the cost of the facility upgrades. In some cases, the available parcel of land may not be sufficient to expand, and so the acquisition of adjacent land would be necessary. Land acquisition may be costly and/or difficult under market conditions and/or zoning restrictions and in gaining the support of neighbors. **We support the County’s efforts to acquire adjacent parcels of land to facilitate the expansion of transfer station facilities.**

---

1 “NIMBY” abbreviation means “not in my backyard.”
As a final note, expanded recycling activities within the transfer station network could provide side benefits in educating the public. Clear signage and scalehouse and attendant interaction at the transfer stations are opportunities to educate the public as they enter, unload, and exit the facilities to inform customers of best waste management practices, local alternative disposal/recycling/reuse options. For example, the facilities could serve to remind self-haulers of HHW and used electronics stewardship waste handling policies and options. Signage on the County’s transfer trailers can also be used to message the public. The public will see this commitment to environmental education and opportunities to recycle and divert as a positive.

Transfer Stations Issues and Assumptions, Question 5.

Do the number and location of transfer stations recommended in the Waste Export System Plan seem appropriate for King County? What changes in demographics could affect the system as configured? Are capital cost estimates in the Plan reasonable?

CAMEO ANSWER:

• These three questions are fairly broad ranging, but, essentially, they seek to determine if the transfer facility plan, as currently envisioned, meets the needs of the County’s commercial and self-haul customers (as well as host neighborhoods) based on logical facility siting and reasonably efficient deployment of capital.

• Given roughly 2,100 square miles covered by the County, it is certainly reasonable for there to be a network of transfer stations. King County has developed criteria for the placement of transfer stations, one of which is for 90 percent of the users of a facility to be within 30 minutes travel time. By this criterion, a number of these transfer stations are out of compliance. (Suggested alternative configurations, which would sacrifice certain of the 19 evaluation criteria and enhance other criteria and are therefore not necessarily better than the current plan, are discussed below.)

• Similarly, the capital cost estimates in the plan derive largely from the number of facilities and the required service levels the facilities need to provide. Although it was beyond the scope of the GBB Team’s analysis to perform a detailed engineering cost validation, our professional review of the capital improvement plan and costs suggests that capital cost planning has been comprehensive yet the cost estimates seem excessively high.

FULL ANSWER:

Appropriate Number and Location:

Given King County’s size (~2,100 square miles) and the distribution of urban and suburban areas in the County, it is reasonable for there to be a fairly significant number of transfer and disposal facilities. While there are no “industry standards” for transfer station (or landfill) siting, Table 6 below compares meaningful geographic, demographic, and facility information for King County
as well as for two other large counties with integrated waste management systems about which
the GBB Team is familiar (all counties serve a population of between 900,000 and 1.3 million).

Table 6. County Comparisons

<table>
<thead>
<tr>
<th>County</th>
<th>Sq Miles</th>
<th>Total Facilities [1]</th>
<th>People Served per Facility</th>
<th>Service Area per Facility (sq miles)</th>
<th>Population Density (persons/sq mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>King County (excl. Seattle)</td>
<td>2,042</td>
<td>7</td>
<td>167,666</td>
<td>292</td>
<td>575</td>
</tr>
<tr>
<td>Alameda County, CA</td>
<td>738</td>
<td>6</td>
<td>240,624</td>
<td>123</td>
<td>1,958</td>
</tr>
<tr>
<td>Montgomery County, MD [2]</td>
<td>496</td>
<td>1</td>
<td>873,341</td>
<td>496</td>
<td>1,763</td>
</tr>
<tr>
<td>Fairfax County, VA (3)</td>
<td>407</td>
<td>10</td>
<td>520,600</td>
<td>204</td>
<td>2,558</td>
</tr>
</tbody>
</table>

[1] Sum of transfer stations, landfills and WTE facilities that receive direct-hauled waste.
[2] Approximately 10 percent of waste is exported to facilities in surrounding counties.
[3] Fairfax County has a WTE, 8 recycling drop off sites, and a Transfer Facility. It also has an ash monofill not
included in the total facilities above.

As shown in the table, King County covers a relatively larger area and has lower overall
population density, although most of the population is concentrated in the western portion of the
County, which would be expected to normalize the numbers somewhat.

The reports made available through this review illustrate that a thorough study has been
performed for the County’s system of transfer stations. Further, the process undertaken by the
County to develop the range of evaluation criteria has been well thought out and documented.
As a result of the process, we understand that three existing transfer stations will be closed
(Alogna, Houghton, and Renton); two existing transfer stations will be rebuilt (Bow Lake, Factoria);
two are to be built at locations to be determined (Northeast Lake Washington, and South
County); and the three relatively newer or remodeled transfer stations (Enumclaw, First Northeast,
Vashon) and two drop-box facilities (Cedar Falls, Skykomish) are to be retained in the system.

There were 19 evaluation criteria developed as part of the process that resulted in this facility
configuration. These criteria can generally be summarized as covering: optimizing service to
customers, minimizing impacts to host neighborhoods, and providing efficient system capacity.
We make two observations about the criteria used:

1. There were no cost metric(s) among the criteria (e.g., achieving full cost-per-ton at or below
some threshold). As a result, it may be possible that the current number and configuration of
transfer stations does not aggressively minimize system costs (as, for example, in a system
where market forces are present).

2. Compaction technology was deemed necessary at every facility (other than drop-box
facilities) rather than on a case-by-case basis depending on the use of the facility.

While it is not our role to comment on whether the criteria selected were “right” or “wrong,” we
note that slight changes to the criteria (or the addition or removal of a criterion) could drive
different outcomes. Specifically, there may be opportunities to differentiate the roles of various
facilities in the system to optimize performance and reduce costs.

For example, compaction is currently planned for every facility. This will require incrementally
larger capital costs for every facility. An argument may be made that criterion 1 (proximity to
users) be relaxed for some other criteria, such as service levels (time in/time out and safety).
Taking the notion a step further, it may be worthwhile to look at two tiers of transfer stations, with some facilities intended to serve primarily commercial collection vehicles and other facilities intended to serve the self-haul generators and provide significantly enhanced recycling and separation. If this strategy were followed, it would involve rethinking the need for compactors at every transfer station.

The County could, for example, construct two or three transfer stations with compaction technology and have those sites dedicated for commercial customers. The remaining transfer stations could be dedicated for self-haul customers, focus on additional recycling opportunities, and use top-load technology with trailers subsequently hauled to one of the commercial transfer stations for final compaction into intermodal containers. Separating commercial vehicles from self-haulers will, at a minimum, increase safety which is criterion 10, and would, by default, imply that additional space at the facility site had been secured (criteria 4, 5, 6 and 7). This would likely sacrifice criterion 1 for 30-minute proximity for 90 percent of users, but there may be some credence to sacrificing location for a subset of facilities if it significantly improves the service at all facilities. This idea would also reduce capital costs for a subset of the facilities that no longer need compactors.

In practice, we note that more detailed analysis is required to validate the notion that only some of the facilities have full compaction. Intuitively, double-handling of wastes would appear to be less, not more, cost-effective. However, the real answer is not so clear-cut for two reasons. First, compactors used for loading intermodal containers require more space than a conventional top-load pit. Although King County is pursuing adjacent parcels at some of the transfer stations, it is not certain that additional land will be acquired, nor is it certain that all of the existing facilities can be meaningfully expanded. If space limitations remain tight at certain facilities, those facilities immediately become candidates for self-haulers only. Second, self-haul waste is shown to contain C&D debris and bulky items that do not compact as well as mixed municipal solid waste (MSW). A transfer station dedicated to self-haul waste might therefore struggle to achieve target densities for intermodal transfer. However, self-haul wastes could be top-loaded and transferred to intermodal loading transfer stations, where they would be emptied and mixed with MSW to achieve target densities. Once again, these scenarios would need to be analyzed further for verification of applicability and feasibility, and it may still be the case that compactors should be constructed at every facility.

As a final note, King County has made impressive – and necessary – efforts at creatively expanding currently permitted transfer station sites. Lessons from higher density areas across the country suggest that making the best use of existing facilities is necessary and possibly the only way to expand integrated solid waste management systems.

**Impact on System of Changes in Demographics**

The primary demographic changes that could affect the system involve continued increases in population throughout the County and especially in the south-County area. Based on population and employment projections through the year 2040, that were provided by the County and were incorporated into the system modeling, it appears that the meaningful demographic changes have been integrated.
Reasonable Capital Costs and Other Cost Considerations

The capital cost estimates in the plan derive largely from the number of facilities and the required service levels the facilities need to provide. Engineering cost estimates for facility construction and/or renovation have been developed based on current year dollars and escalated appropriately to the year of construction, and associated financial modeling appears to adequately capture these costs. Although it was beyond our scope to perform a detailed engineering cost validation, our professional review of the capital improvement plan and costs suggests that capital cost planning has been comprehensive but resulting in a high estimated cost for the transfer stations. The “2006 Facility Master Plan Update” states the construction cost of the proposed Bow Lake Transfer/Recycling Station to be $44,200,000. Although this includes the acquisition of WSDOT property and the demolition of the existing facility, the projective cost appears high. The GBB Team which recommends that the Solid Waste Division review these figures as implementation nears.

In addition to the capital costs, it would be informative to obtain current, or else projected, full cost-of-service data for each of the individual facilities. In the competitive marketplace, market forces would be expected to drive larger facilities that can operate on a lower unit cost basis. In the King County system, it may be informative to have facility-specific cost metrics as an additional variable to evaluate the system.

In the absence of a cost-related metric such as facility-specific full costs and projected facility throughput, it is difficult to validate that capital is being distributed most efficiently. System efficiency could be better evaluated, and possibly the range of facility evaluation criteria improved, if some metric associated with projected full cost per ton were available. Further, given that the County is able to manage the entire network of facilities as a “system” that does not benefit by competitive market forces, such facility-specific cost data would be expected to further enhance the evaluation of individual facilities.

Alternatively, King County may benefit from having a customer base that is avidly pro-recycling and willing to pay for greater diversion and lower facility intrusion into local neighborhoods than is possible in other regions of the country. It may be that lack of a cost-related metric is not meaningful in King County. It also may be the case that the evaluation of privatization within the King County system, which was reported by the County to have been evaluated with input from both municipal and commercial stakeholders, further supported the current facility configuration and reduced the importance of cost as an evaluation criterion.

As a final note, the total system cost to the ultimate customer – households and businesses – encompasses collection, transfer, transport, and disposal (processing). Evaluating the cost of the transfer, transport, and disposal in a vacuum from collection may not result in an optimized system, which would entail minimizing the sum of collection, transfer, transport and disposal. It was beyond the scope of our analysis to conduct such a “full system cost” review. However, it was reported by the County that industry representatives on the Solid Waste Advisory Committee (SWAC) did participate in such a system planning process. The SWAC argued for one additional new transfer station and opposed one proposed closure (Renton Transfer Station) because of their own economic interests in reducing their driver’s “windshield time” on routes. The SWAC was also reported to have expressed interest in commercial development of large transfer stations: provided that there might be a need for public subsidy; self-haulers (roughly one-quarter of King County volume) would not be accepted and facilities would meet minimum zoning codes. After robust debate, it was reported by the County that hauler representatives voted to support the
proposed plan. Given the complexity of such a system planning process, King County should be
commended for undertaking such an effort and evidently achieving support from diverse public
and private stakeholders.

Transfer Stations Issues and Assumptions, Question 6.

What are alternative options for providing compensation to host cities, such
as, but not limited to, one time payments, payments based on tonnage,
payments based on traffic, payments based on lost revenue? To what do we
benchmark host city compensation payments – for example, lost revenue
from utility tax or property tax?

CAMEO ANSWER:

• There are numerous possible methods by which host compensation could be established; GBB
believes the most common mechanism for host fees is a strict tonnage-based payment,
typically in the $1 to $5 per ton range.

FULL ANSWER:

Host municipality fees are in wide practice in the solid waste industry, for obvious reasons. No
matter where in the country one lives, it is likely that having a landfill, transfer station, or other
waste management facility located within the jurisdictional border will be perceived negatively
for a variety of reasons: increases in traffic congestion, wear-and-tear on local roads, potential
for groundwater contamination, litter, demands on local wastewater treatment utility, and the list
goes on. Especially if a facility is accepting wastes that were generated beyond the borders of
the host municipality, host fees are a conceptually justified and time-tested means of
compensating the local jurisdiction for hosting undesirable uses. A partial list of the basis for
charging (or the stated uses of) host fees includes: roadway upkeep, litter control, hazardous
waste management, groundwater monitoring, recycling funding, conservation funding, pollution
prevention, disincentives for waste import, and there are likely many others. In the case of
private companies seeking a site for a large regional landfill, host fees may represent a
significant economic boon to a smaller jurisdiction.

King County seeks feedback on the alternatives for implementing a host fee that may be paid to
the incorporated jurisdictions within the County that host transfer stations. Conceptually, there are
many alternatives, and, hypothetically, a host fee structure could be based on virtually any basis,
whether measured or negotiated. With over 3,000 counties and roughly 25,000 municipalities in
the country, the GBB Project Team cannot claim to have compiled a comprehensive list of the host
compensation mechanisms in place. In practice, we believe it is fair to say that per-ton host fees
are the most common and conceptually among the simplest to understand and implement, and the
range of $1 to $5 per ton has been experienced by the project team on recent projects.² Per ton

² Note that the $1 to $5 range may represent the sum of multiple host fees and surcharges added to tip fees by
various state and local regulatory bodies. For example, all wastes in Ohio are charged one fee that is payable to
the state Department of Natural Resources; one fee that is payable to the Solid Waste Management District (a single
host fees are ongoing over the life of the facility, vary in exact proportion to waste deliveries, and are reasonably thought to correlate to roadway usage, litter generation, traffic congestion, and other negative impacts that come from the local solid waste facility.

We note that there may already be an indirect financial benefit to jurisdictions by hosting transfer stations. All customers pay a uniform tip fee no matter what transfer station they use. Since direct haul of wastes in compactor trucks is the most costly form of waste transport and since longer travel times result in less time on route actually collecting set outs, the ability of commercial haulers to unload within the local area keeps their costs down. The residential and commercial collection systems within host municipalities benefit from shorter travel time and mileage to the disposal location compared to surrounding municipalities, and, in theory, their collection rates could reflect this (although it was beyond the scope of our analysis to consider the collection system in detail).

It is worth mentioning that there may be some contradiction to the notion of host fees in King County's current "system". Specifically, the County has established the policy that the tip fee will be uniform at all of the transfer stations in the system. This disposal fee uniformity is in spite of the fact that the actual full costs to transfer and dispose of wastes at each facility may differ from facility to facility. In an open market, wastes tend to flow to the least cost combination of transfer, transportation, and disposal. In the absence of local pricing variations, some municipalities may receive greater or lesser benefits from a host fee due to the artificially level system tip fee; especially those municipalities that do not host a transfer station are likely to object to the internal transfer of monies to another member of the "system".

Many host fees – especially those that have been established at the state regulatory level – are tagged for specific environmental programs. In King County, it may be necessary not only to establish host fees, but also to establish the allowable uses for host fees as a true mitigation for the local facility, rather than as a general fund contribution for municipalities that happen to host a transfer station.

Public perception of host fees is generally positive for the residents and businesses within the host municipality, especially if the proceeds from the fee can be applied in a manner that visibly demonstrates the benefit. Conversely, host fees are generally considered to be negative by the hauling community and/or waste generators in surrounding areas – either because they are perceived as yet another tax or because they are perceived to artificially drive up the cost of disposal.

As a final question (but one with limited bearing on our response), we understand that there are one or more private transfer stations either in the County unincorporated area or else in one of the member jurisdictions that primarily move C&D debris. It would be of interest to know if a host fee has been negotiated with any of these private facilities.
Transfer Stations Issues and Assumptions, Question 7.

Should self-haul service be provided and, if so, at what levels and how should the cost be covered?

**CAMEO ANSWER:**

- King County residents and businesses will almost certainly demand that they be provided with the ability to self-haul their wastes.

- Self-haulers are shown in the range of documents provided to create operational challenges at the King County network of transfer stations.

- The County will most likely need to continue providing this service, and it is reasonable to consider implementing a transaction-based fee as discussed in Chapter 10 to the Comprehensive Plan.

- We note that in many other parts of the country, especially where both collection and disposal are under unified control, offering a scheduled or call-in residential bulky waste collection service can greatly reduce the volume of self-haulers at local transfer and disposal facilities.

**FULL ANSWER:**

Ultimately, the “right” to self-haul is typically considered very important by a local population, and given that King County has historically provided an outlet for self-haulers, it would be expected to be an uphill battle to significantly reduce or eliminate this service without some concession or other replacement service provided. For this reason alone, the GBB Team thinks that such a service should continue to be provided.

However, given the well documented (and verified during our site observations) operational challenges (and corresponding transaction costs) that the volume of self-haulers places on the network of transfer stations, we also believe that conversion to a transaction-based fee structure as described in Chapter 10 of the Comprehensive Plan is reasonable and, in fact, desirable. This fee structure acknowledges the legitimate burden a high volume of small haulers places on the system. Although the per-ton rate is higher for self-haulers under this structure, this essentially translates to a “convenience premium” – which, if the market demands it, could even be provided at a market-supported rate (rather than a rate established by King County based strictly on a full-cost model). We note that there is strong precedent within the solid waste industry to use rate setting strategies to induce desirable waste and recycling behaviors – one of the most common being volume-based pricing on waste collection (such as the program offered by the City of Seattle). If self-haulers put pressure on the system, adjusting the rates to self-haulers proportionately upwards may reduce the volume of self-haulers. Of course, significant increases in the proportional rates paid by self-haulers would likely be perceived negatively by the self-haulers (who would cite an unfair bias) and be supported by commercial haulers.
As a related matter, any significant rate increases to self-haulers would be best implemented in conjunction with making sure that the collection infrastructure (both County unincorporated as well as incorporated municipalities) could accommodate collection of bulky wastes from residents and businesses. Nationally, many municipalities provide for bulky item collection for residents either through municipal or contracted curbside collection (crews will collect everything placed at the curb) or through a special bulky item collection system. Special bulky item collection can be performed under various time frames such as scheduled monthly, quarterly, semi-annual or annual service, or on-call scheduled collection where the resident calls the municipality to schedule a pick-up.

Information regarding the collection system among the member jurisdictions was not provided as part of the review package and is outside the scope of services for this review. However, in King County, the self-haul volume was high enough to suggest that bulky waste collection is either limited or else not provided at all (making special call-ins to a private hauler especially expensive because there is no such service readily available). There is a wide range of strategies available to provide cost-effective bulk waste collection, even extending into rural areas, that would be expected to reduce the reliance on self-haul. Implementation of such bulk waste collection services, in conjunction with using the self-hauler fee structure to modify customer behavior, would likely benefit the County’s transfer station network.

If the self-haul deliveries were reduced, this also implies that bulk waste collection and transportation infrastructure has increased, or else the potential for illegal dumping has increased (especially from small repair and construction contractors). If bulk waste collection is expanded, municipalities that do not currently offer any bulky waste collection through their current curbside refuse collection program would see an impact on their collection and disposal cost for their contracts. Individual subscription customers may see an increase in cost if contractors are required to collect bulky items at the curb. Perhaps, there is a solution that involves the County reducing tip fees for confirmed commercial bulky waste deliveries (would require coordination with each member municipality), as such deliveries imply that some volume of self-hauling has been shifted to a bulk waste collection program.

As a final exercise on this subject if the majority of County residents were provided a built-in bulky waste collection system with their regular refuse and recycling collection, self-haul traffic at the transfer stations could be reduced by an estimated 6,358 loads per week (See Table 7). Reducing this many loads in the transfer station system may even impact the configuration of the transfer facilities, or conversely, may enable some operating cost savings by reducing the hours of operation that are currently required to support self-haulers. There would, however, be an increase in commercial hauling to the transfer stations because of the bulky collection but this would be significantly less in number than the self-haul because of the compaction of the material.
Table 7. Self-Haul Transactions

<table>
<thead>
<tr>
<th>Self-Haul Loads Per Day</th>
<th>Weekdays</th>
<th>Weekend Days</th>
<th>Total Loads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Daily Loads</td>
<td>3,660</td>
<td>6,745</td>
<td></td>
</tr>
<tr>
<td>Total Weekly loads</td>
<td>18,300</td>
<td>6,745</td>
<td>25,045</td>
</tr>
<tr>
<td>Reduce for Bulky Item collection</td>
<td>20%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Reduced number of loads</td>
<td>3,660</td>
<td>2,698</td>
<td>6,358</td>
</tr>
</tbody>
</table>

Waste to Energy, Question 8.

Understanding that analysis of WTE will take place in the Comp Plan update process – how might including WTE technologies in King County’s solid waste strategy affect transfer station or waste export plan recommendations?

CAMEO ANSWER:

- It depends on type and size, location, and number of WTE facilities.
- A single WTE facility with capacity of one million tons per year (3,000 tons per day) located on the Cedar Hills Landfill site would mean no change to the plan for transfer stations and potential elimination of the need for exporting waste. In such a circumstance, King County would need to provide for backup landfill capacity in case the WTE facility needs to divert as well as provide for disposal of ash not otherwise beneficially used at a double-lined landfill.
- If smaller sized WTE facilities are implemented and not at Cedar Hills, a transfer station could be eliminated for each one implemented, but the exportation of waste would continue.
- WTE disposal cost for a 3,000 TPD facility would be approximately $75 per ton, before ash disposal and electricity revenues.

FULL ANSWER:

There are two approaches to the analysis of WTE in the new King County Comprehensive Plan: (1) utilization of proven technology and (2) evaluation of innovative technologies. The proven WTE technology has two types, mass burn incineration and refuse derived fuel (RDF), which combined have a total of 89 facilities operating in the United States. A single WTE facility to process the County waste (one million tons annually) would be a 3,000 TPD plant. This would be similar to the facilities in Fairfax County, VA; Pinellas County, FL; and Miami Dade, FL. The first two are mass burn facilities and the last is an RDF facility.
A single facility using proven technology sized to process the projected 3,000 TPD would cost approximately $460 and 520 million\(^3\) and require 10 to 20 acres of land depending on buffering, neighbors, etc. If placed on the Cedar Hills site, no disruption of the existing collection and transport network would be required. Because WTE ash has a volume of approximately 10 percent of the MSW burned, and assuming that WTE facility operation started on, or before 2011, no export would be required except possibly for bypass and non-combustible materials. The resulting disposal cost would be in the neighborhood of $75 per ton before ash disposal and electricity revenues. Cedar Hills Landfill could be the depository for ash which is much more stable a product than Municipal Solid Waste and therefore less expensive to handle. The facility could be built in the time before the Cedar Hills Landfill is expected to close.

A WTE facility would generate 65 to 70 Mw of electricity, which could satisfy a portion of the electricity requirements for King County and reduce the emissions from fossil fueled alternatives. A number of smaller WTE facilities could replace one or more transfer stations with an even greater reduction in emissions resulting from truck transport. Based on the projections in the Plan, four of the existing transfer stations or their replacements (Algona, Bow Lake, Factoria and Houghton) would have sufficient waste to achieve a scale necessary to be considered viable. The GBB Team regards that threshold to be 500 TPD. If one or more of the WTE facilities were close enough to steam customers, then they could serve industrial customers or, perhaps, a district heating/cooling arrangement similar to Seattle Steam. The sale of steam to interested customers would generate revenue at a higher level than electricity, due to the low prevailing electricity value in the King County area.

In terms of diesel fuel consumed in transporting waste out of the County versus processing it in a WTE facility, some 600,000 to four million gallons would be saved depending upon destination points. Additionally, there will be savings in landfill emissions and operating landfill equipment by diverting the MSW to the WTE, although this will have to be further examined.

---

Financial Assumptions, Question 9.

Review County's economic analysis and assumptions in sensitivity analysis for early waste export and waste withdrawal.

CAMEO ANSWER:

• The County’s overall rate model and economic analysis is thorough and appears to adequately capture the full system costs but does so in a manner that does not illustrate the full cost of specific activities.

• While it was beyond the scope of our analysis to validate the engineering cost estimates, our review suggests that the County has comprehensively projected its long-term system costs under a variety of alternatives.

• The waste export scenarios selected – full early export, partial early export, and partial withdrawal – appear to be reasonable, although a fourth scenario that contemplates predominant waste export with perhaps 15 percent of the waste stream continuing to be delivered to the Cedar Hills Landfill may be of interest (such strategies have been implemented elsewhere). However, many of the assumptions that would be needed to complete the economic analysis were not readily available in the documentation; hence the answers are burdened from a lack of data.

FULL ANSWER:

The County’s overall rate model and economic analysis is impressively thorough and appears to adequately capture the full system costs. Facility operating costs, landfill closure and post-closure costs, capital improvement planning, debt service, management and administration, other County programs, and allocated indirect costs (legal, financial) are all accommodated in the model. Although no further detail was provided beyond the summary economic model outputs, and while it was beyond the scope of our analysis to validate the engineering cost estimates, our review suggests that the County has comprehensively and conservatively projected its long-term system costs under a variety of alternatives.

The waste export scenarios selected – full early export, partial early export, and partial withdrawal – appear to be reasonable. However, insufficient information was provided to validate the results, and we have several comments.

For all of the scenarios, it appears that a relatively simplified assumption of applying Snohomish County’s transport and disposal costs was used to represent the likely cost of these elements for King County. The GBB Team is not familiar with the regional (i.e., Washington and Oregon) markets for landfill disposal, and because of this unfamiliarity may be asking the question unnecessarily, but at some point, if it has not already been performed, we recommend that the County conduct a true regional disposal market study to determine the expected negotiated tip fees for long-term disposal agreements at the range of landfills within reasonable distance from King County that have excess capacity. With the guaranteed waste flow that King County could provide, there may even be credence to the notion of procuring new disposal capacity from the private marketplace in a closer-in landfill to be developed specifically for King County.
Milestone Report 4 defined full early export as including the closure of the Cedar Hills Landfill at the time early export commences. This indeed would accelerate the Closure and Post-Closure fund accrual burden and therefore increase costs immediately to some extent (although post-closure funding has been achieved already). However, there was no mention of the alternative of keeping the Cedar Hills Landfill open and operational on a reduced basis to serve as overflow/emergency disposal. Similar strategies have been implemented elsewhere in the nation and may be worth evaluating in King County. It is not surprising that the cost of full early export is higher than the current cost under the assumptions that were used.

Partial early export is cited as the most cost-effective of the options, but is still higher than the current system. The notion of partial early export has been implemented in several county integrated waste management systems in Maryland counties in the Baltimore-Washington metropolitan area. Conventional wisdom in these counties is that it will not be possible to expand the existing landfill and/or site a new in-county landfill. However, with long-haul transportation via road as the only current transportation option, there is an acknowledged shortage of transportation capacity for various reasons, and the in-county disposal facilities have had to remain open to handle 10 to 15 percent of all wastes generated that cannot be accommodated in the export system. This situation (predominant export of waste with the local in-county landfill remaining open for overflow and emergencies only, and with a goal of prolonging closure date indefinitely) was not evaluated in King County, but may alleviate the problems associated with accelerating closure and post-closure funding.

The withdrawal scenario does not provide sufficient information to verify. The write-up mentions that withdrawal would “result in operating cost savings,” which is certainly expected. However, it is not clear from the write-up if this scenario contemplated additional reduction in this size of the system, for example the elimination of one or more transfer stations. It would seem unlikely that any except a geographically contiguous group of municipalities would decide to exit the system (geographically spread-out jurisdictions would lose any ability to capitalize on centralized infrastructure), which would suggest that one or more regions of the County’s service area may be eliminated. Further, given the dearth of landfill capacity near King County, the only way it would make economic sense for withdrawal would be for a large enough fraction of the total waste generation to be carved out to lure viable, economically attractive transfer and disposal.4

While the Solid Waste Division’s cost and revenue numbers for its operations are comprehensive they seem not to be geared toward the management of specific activities. When managers of operations have access to the full cost of their operations and are held accountable to those costs, the perspective of these managers change from “get the job done” to “get the job done in a cost-efficient manner.” If upper management empowers and encourages its managers and supervisors to reduce costs, then they often will make suggestions that save the jurisdiction significant sums of money. To understand the costs of each activity, these managers will have to have access to the cost data for them. It is recommended that the County use full cost management techniques to drill down to a cost per ton for each transfer station.

4 Seattle and Milton represent other jurisdictions that could join together with any jurisdictions that fracture off of the King County system. It would seem conceivable that 20 percent of King County waste generators adjacent to Seattle could break away and join with the Seattle system if the opportunity presented itself and it was possible to negotiate more favorable transport and disposal through that system.
Sustainability, Question 10.

Are there models or methods for the transfer of solid waste from the point of generation to final disposal that minimize fossil fuel consumption and air pollution?

**CAMEO ANSWER:**

- Put in place an infrastructure whereby collection vehicles can operate with cleaner fuel.
- Legislate standards by which collection vehicles must operate using cleaner fuel.

**FULL ANSWER:**

Diverting any significant amount of material out of the solid waste transfer system at any point prior to ultimate disposal will lower its fuel use and emissions. Achieving 60 percent recycling is therefore a desirable and sustainable goal. It is a reasonable assumption that recyclable materials will be processed locally, and even if shipped overseas from the Port, will have lower fuel use per ton. King County has significant barriers to achieving this goal, not the least of which is the institutional or jurisdictional structure resulting from the need for the County and 37 cooperating cities to act in concert. The County needs to adopt aggressive sustainability goals and provide leadership for the entire community to achieve these goals and reduce the environmental footprint of the solid waste system.

Optimizing the collection vehicle routes using GIS and routing models coupled with GPS and online collection and transfer vehicle monitoring and communication will minimize fossil fuel expended. Call-in bulk and yard waste collection will also eliminate unnecessary truck travel. The efficiencies gained through these techniques typically improve efficiency by 10 to 25 percent, which would be reflected in the lower consumption of diesel fuel and resulting emissions. These technologies are in widespread application in the waste industry both in public and privately operated systems. Further, commercial delivery fleets such as UPS and Federal Express have used them for years.

Conversion of collection and transfer vehicles to natural gas, either LNG or CNG, reduces the air pollution resulting from the use of diesel fuel. Conversion to natural gas-fueled trucks from diesel-fueled trucks will significantly lower CO$_2$, sulfur, and particulate emissions and will potentially lower NO$_x$. There is a potential maintenance savings available from natural gas-fueled engines. These natural gas fuels are in daily use in solid waste collection fleets in California and elsewhere.

A longer range method to lower emissions is to convert the collection vehicle fleet to hybrid technology. The U.S. Department of Energy’s Oak Ridge National Lab ("ORNL") points out that the stop and go nature of waste...
collection is particularly suited to efficiency gains through the application of hybrid technology.

ORNL estimates the fuel usage efficiency gain in collection is 140 percent when hybrid technology is employed. Kenworth and Peterbilt have medium duty hybrid trucks in their 2008 models and other manufacturers are planning to add hybrid trucks in the near future. As hybrid trucks are coming on the market, a coordinated multi-year purchase agreement for all collection vehicles used in King County could provide a significant incentive to truck manufacturers to advance the roll-out of this equipment.

Emissions and greenhouse gas calculations should be done to compare the Export Plan to a WTE alternative; see comments above.

Approximately half of the delivery of waste and recyclable materials to the transfer stations is accomplished in generator-owned vehicles, i.e., “self-haul.” This reliance in King County on self-haul increases the number of vehicle trips to deliver these materials to the transfer stations. We suggest that the County review emissions and traffic impacts resulting from self-haul waste collection and quantify the alternatives of increased collection by commercial collection companies. Further, the County should review the policies that promote and encourage self-haul.

In the answer to the Projection Question, the GBB Team has identified specific recycling actions that it believes will achieve the reduction of self-haul and all the associated impacts it has on the transfer and disposal system.
III. Commentary

The members of the GBB Team have read through the documents, interviewed stakeholders and staff, made site visits, and discussed King County’s solid waste system at length. Although not an explicit task of the Third Party Review Project, the Team determined it would be helpful to the County to comment on topics in addition to questions answered by the Team. These comments are segregated by topics for quick reference:

Cedar Hills Landfill

Maximize Space: King County should maximize the space it has so as to keep long-term costs down. Members of the GBB Project Team have discussed with staff two scenarios to prolong the life of this facility.

First is to maximize space by constructing engineered walls that will allow the County to fill out further along the sides of the landfill. This would change the current slope of 3:1 to a 1:3 ratio. One example of where this is done is in the Town of Babylon, New York.

Second is to take advantage of the 900-feet of extra buffer zone around the Cedar Hills Landfill’s perimeter and especially along the south side of the Landfill which the County is not currently using. A Buffer zone means that part of a facility which lies between the active area and the property boundary. Washington State’s requirement of a buffer zone distinguishes between residential and non-residential neighbors. For non-residential, Washington State’s requirement is a buffer zone of 100 feet. The buffer zone for residential neighbors is 250 feet. The Cedar Hills Landfill, however, is designed with a 1,000-foot buffer. The GBB Team understands that the County had promised the community to provide extended buffer area where the landfill is adjacent to residential homes. Even so, 1,000-feet is more than generous. On the south side of the facility, however, the neighbor is a

---

 Criteria For Municipal Solid Waste Landfills: Chapter 173-351-200, 140(3-b); “So that the active area is any closer than one hundred feet (thirty meters) to the facility property line for land zoned as nonresidential or for unzoned lands, except that the active area shall be no closer than two hundred fifty feet (seventy-six meters) to the property line of adjacent land zoned as residential, existing at the time of the purchase of the property containing the active area.”
Superfund site which processes organics, rather than a residential abutter. There seems to be no operational reason why this land cannot be used to maximize space, keep disposal costs lower to King County’s tax payers for a longer period of time, and keep the site operational and thereby a community resource for a longer period of time.

Planning for Natural Disasters: While the GBB Team intuitively understands that there may be some benefit to reserving “emergency disposal” capacity at Cedar Hills Landfills, in general, the Team believes that the Waste Export System Plan and associated planning for the closure of Cedar Hills should proceed without influence from the emergency management process or potential future disaster debris disposal capacity. Major natural disasters bring with them federal and state financial reimbursement which would likely cover between 75 to 100 percent of the cost to process, transport, and dispose/recycle disaster debris.

The GBB Team does recommend that the County’s Solid Waste Division provide the Landfill, whether closed or active, to the County’s emergency management organization as a staging/processing site in the event of a natural disaster.

Operations at Cedar Hills Landfill: The GBB Team members to a person were impressed with the current supervision and operations of the Cedar Hills Landfill. The compaction being achieved, clean operations, and care for details showed a level of professional management not always found at landfills.

Clean and Green

The GBB Team strongly agrees with the Solid Waste Division that the transfer stations need a make-over. These facilities have been the center piece of a progressive waste management system that has functioned well for the County since the thousand days of the Kennedy Administration. The County would be remiss if it did not make these transfer stations the centerpiece of a new and updated progressive waste management system.

The Waste-Export Plan currently provides little definition and emphasis to designing these facilities so as to increase diversion, promotes environmental awareness, and separate commercial from self-haul customers. The new transfer stations should, as an ultimate goal, provide self-haulers with ample opportunity to separate material for diversion. This should include all the traditional recyclables (e.g. glass, plastics 1&2, aluminum, all paper) as well as household hazardous waste, e-waste, textiles, and construction and demolition debris. Self-haulers should become so accustomed to the options before disposal that they begin to pack their vehicles with reusables to be unloaded first, recyclables second, and finally refuse.

The County’s representatives should be trained and vigilant about spotting and encouraging best practices among their customers as well as be knowledgeable about other local options for materials (e.g. Habitat for Humanity). The County should look into partnering with organizations such as Goodwill and Habitat for Humanity to divert reusables such as textiles, books, and building materials.
All facilities should have a coordinated education that integrates messages, information, and color in its signage, brochures, call centers, public meetings, and public service announcements. The message of keeping King County Clean and Green should be emphasized. Each facility should have a kiosk of environmental information that customers can use and the employee knows. Signage on transfer trailers should also be added.

Since these facilities would be at the center of a new waste management movement, garbage should not be the emphasis. These are more “Materials Resource Centers” than “Transfer Stations.”

By placing an emphasis to divert waste to reusable and recyclable ends at its Materials Resource Centers and given the United States Supreme Court’s recent ruling in the case of United Haulers Association Inc. Et Al. v. Oneida-Herkimer Solid Waste Management Authority Et Al., which upholds the counties’ flow-control ordinances, King County should evaluate the prospects of controlling its own material and the material generated by its 37 member jurisdictions through a Materials Recovery Facility. The ramifications of this recent court decision are not fully fleshed out, but an opportunity may exist for King County that should be fully evaluated.

Intermodal Issues

Early Export: King County would benefit in a number of ways by exporting a greater percentage of the waste earlier than currently suggested in the Waste-Export Plan. Specifically, it would give King County the opportunity to:

- Ramp up and refine operations over time, based on experience gained;
- Postpone, potentially, the need to build an intermodal facility to accommodate a lower volume;
- Spread out capital costs over time (particularly containers);
- Phase in higher charges to residents of member communities;
- Go through another procurement for the balance of the volume if the County was not satisfied with handling of the tonnage procured as part of the Early Export program; and
- Use the Cedar Hills Landfill longer as a back-up destination in the event preferred disposal methods could not be accomplished for brief periods of time. In light of the
paucity of such options likely to be available in the future, the Cedar Hills reserve should
give King County tremendous negotiating leverage with its member jurisdictions as well as
with the City of Seattle, in the event King County determines that it is in its interest to
combine all County waste flows to obtain lower rates and/or better service from its
transportation and disposal providers.

The amount of MSW chosen to export should be based on a volume which equates to an efficient
mode/carrier operating plan. This amount should maximize the use of all assets to be acquired,
not just a volume which equates to a specific, even numbered percentage of the County’s then
current waste volume. The cost per ton of operating the Cedar Hills Landfill does not vary nearly
as significantly as volume changes by 10 to 20 percent as will the unit charges assessed by a rail
freight carrier as volume varies. King County should focus on ramping up the volume exported in
increments that equate to maximizing the volume that can be efficiently handled by the fewest
number of heavily loaded trains and containers.

Long Haul Transportation: Railroad negotiations are difficult and must be approached with an
objective to minimize capital cost and multiple sites and ensure rail reliability. The following
points are offered:

- Railroad negotiations will be difficult and take a long time to consummate. It is imperative
to split transportation from disposal procurement, at least initially, so that the project cost
elements can be compared and contrasted to inform the Division’s negotiating team.
Transportation and disposal can always be combined into one contract with one party
after the Division has achieved its negotiating objectives;

- Capital costs can be minimized by avoiding/postponing the construction and operation of
a dedicated, intermodal facility or by sharing the capital costs of any such dedicated,
intermodal facility with another party facing the same capital cost challenge i.e. the City
of Seattle and other unaffiliated jurisdictions;

- Multiple intermodal sites only should be considered as necessary to effect competition in
the long haul transportation of waste-by-rail;

- Rail transportation is reliable provided it is viewed through the prism of a sufficiently long
time frame. While the freight systems (infrastructures, signal systems, dispatching
protocols, etc.) of the UP and BNSF are sufficiently robust, especially in the Pacific
Northwest, the subject waste-by-rail haul lengths are sufficiently short and the associated
freight revenue to the carriers will be viewed by them as sufficiently modest to result in the
Division’s trains likely receiving a low priority dispatch. As a result, the waste will not
move over the rail system like clockwork. Initially, the impact may be limited to the
Division having to supply more containers and chassis than should be necessary. As
volumes grow significantly, or should waste flows be combined with those of Seattle, the
cost and other consequences of inconsistent rail transportation performance will be far
more pronounced; and

- Because of its newfound confidence in its general competitive advantage in handling the
commodities it seeks to transport, the railroad industry is increasingly reluctant to make
long term rate and/or service commitments, as manifest in contracts. Therefore, the
Division would be well advised to expect to incur additional capital and operating costs associated with a waste-by-rail intermodal system.

Rail transportation, with its private rights-of-way, presents a very different competitive environment than does trucking or water carriage, which utilize public highways and waterways. In addition, railroad rates are designed to yield whatever the market will bear. The rail carrier pricing calculus considers the costs incurred in providing transportation, the market value of the commodity to be transported, and competitive transport options. As a result, shippers of high volume, low value bulk commodities such as MSW are well advised to take a strategic approach to potential contracting with railroads. King County, or for that matter any prospective railroad customer, must recognize that there exists a window of opportunity which, if seized, can impact future cash flows significantly over the entire economic life of any project it develops or operates. Once the window of opportunity closes, any railroad customer’s leverage to negotiate will decline significantly while that of its serving railroad(s) will increase.

The freight railroad industry’s pricing power has not been this strong since the build up to World War II and shows no sign of abating between now and any potential commencement date of MSW export, early or otherwise. Freight railroads are so confident of their competitive advantages compared with other modes and so sure that motor carriers, in particular, face such growing and daunting challenges in the future that they are increasingly reluctant to sign the kind of long-term contracts that typically would be the manifestation of good public policy, assuming a truly competitive and competent, multimodal procurement had run its course. Therefore, it is incumbent upon King County to give early, thorough and flexible consideration to the potential procurement of railroad freight services. Because railroads do not operate in nearly as competitive an intramodal marketplace as do motor carriers, they quite simply cannot be expected to respond as quickly to a Request for Proposals as King County’s Solid Waste Division might expect or be accustomed to.

Given that the rail mode emerged as the potential low cost mode in the County’s analysis, it is incumbent upon King County to make sure it builds sufficient time into its procurement calendar to ensure that both UP and BNSF submit bids. The County also should engage the carriers, helping them as necessary to ensure that they understand the County’s needs and schedule. Thorough procurement considerations extend both in the direction of considering a joint procurement with the City of Seattle if it is in both parties’ interest to do so and to go to the extra effort to solicit the provision of the transportation and disposal functions separately, even if King County decides ultimately to contract with one party for both functions. Flexible procurement considerations require the recognition that facts and preferences are likely to change significantly between now and 2028, and even more after that. The railroads may be able to accommodate King County’s MSW at their intermodal yards over the foreseeable future, but eventually price the handling of MSW through their yards at charges that would justify King County building its own intermodal yard or sharing one with the City of Seattle. For these and similar reasons, King County would be well advised to try to keep its options open, which could include leasing out the Harbor Island or an alternative site until such time as it were needed by the County.

The economics of railroad transportation are such that the higher the volume of MSW to be tendered within King County, the more competitive the rail mode will be as compared with trucking, and likewise, the higher the volume, the lower the average unit costs incurred by any freight railroad. However, the extent to which those lower unit costs get passed on by BNSF or UP to King County depends upon two principal factors:
1. The degree to which the rail carriers perceive (or can be persuaded to believe) that King County has a realistic transport option at a lower price over the term of the contract; and

2. The degree to which each rail carrier believes it can make more money for the same or less effort hauling traffic generated by other customers.

While both railroads have and will continue to have almost an unlimited ability to make such capital improvements as necessary to increase capacity in small increments, each attempts to maximize the revenue it can generate at each given level of capacity, as could be expressed in the number of loaded and empty trains they could handle in each direction each day. King County and its residents may come to believe that the railroads are seeking to charge too much per ton, especially given how relatively short the haul would be. However, the railroads look at it a completely different way. From the railroads' perspective, if there are only so many slots they can fill in a day, at a given level of capacity, a rail carrier wants to maximize the revenue generated by each slot (train) whether a train goes 300 miles or 1,500 miles. So, the relatively short distance that King County's MSW might move over BNSF or UP is essentially competing for "shelf space" with international intermodal traffic moving between Chicago and Tacoma or grain moving between Minnesota and Seattle; much greater distances.

It is true that long haul transportation of waste by motor carriers outside of King County traffic will result in only a negligible increase in overall highway congestion, but sending waste through the high traffic density Seattle area will cause concern (and upward pricing) on the part of the railroad(s).

Were multiple intermodal facilities to be used within King County, it would be ideal to build a transfer station immediately adjacent to a BNSF intermodal facility and another transfer station immediately adjacent to a UP intermodal facility, particularly if weight restrictions limited the ability of King County's Solid Waste Division from maximizing the full utility inherent in compacting MSW. All else equal, the Division should consider the potential advantages of choosing intermodal facilities at some distance from each other so as to minimize the number of miles that would be necessary to connect all transfer stations with all intermodal facilities.
IV. Appendices

1. Review Methodology and Expert Panel
2. Organizational Chart and Experts' Résumés
3. GBB Team Questions and Additional Analysis Requests, County Response, and Additional Documents Provided and Reviewed
Appendix A

Review Methodology and Expert Panel

Ordinance 2006-0263 established a process for an independent, third-party review of critical issues and assumptions identified by various stakeholder members of the federated regional waste management system, and this methodology is responsive to that directive. The RFP identified this review as a high-priority, short timeline project and clearly identified the key questions and data to be reviewed, tasks to be performed, and project communications and local support required to achieve a successful outcome.

The tasks associated with the review and analysis of King County’s system, to render the consensus professional opinion on the Waste Export Plan and the range of questions posed by the County, are delineated in the following paragraphs.

Assemble Panel of Experts

Table 1 below presents the third-party review panel of experts with a mapping of each to their lead area(s) of expertise for the review project. Brief résumés of these parties are included at the end of this Appendix.

<table>
<thead>
<tr>
<th>Harvey Gershman, GBB</th>
<th>GBB Officer-In-Charge, Quality Control and Client Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chace Anderson, GBB</td>
<td>Project Management, Public Education</td>
</tr>
<tr>
<td>Tim Bratton, GBB</td>
<td>Rate Analysis, Capital Plan, and Quality Control</td>
</tr>
<tr>
<td>Frank Bernheisel, GBB</td>
<td>Recycling Operations, Transfer Station Facility Operations, Waste-to-Energy</td>
</tr>
<tr>
<td>Walt Davenport, MSW</td>
<td>Collection Systems</td>
</tr>
<tr>
<td>John Culbertson, MSW</td>
<td>Solid Waste System Financial Analysis</td>
</tr>
<tr>
<td>Charles Banks, RLB</td>
<td>Waste-by-Rail, Long Haul, Economics</td>
</tr>
<tr>
<td>Bob Brickner, GBB</td>
<td>Recycling and Diversion Analysis</td>
</tr>
</tbody>
</table>

One of the primary strengths of the GBB Team is certain overlap of expertise in the review panel and the willingness of all to engage one another in spirited debate about key issues.

During the contract negotiations for the third-party review, King County stakeholders suggested the addition of two more experts drawn from municipalities of similar size and similar situation that would add the local government perspective, improve the credibility of the review panel,
and secure an outcome that would achieve consensus. GBB identified the experts shown in Table 2 from local jurisdictions and approached them about participation. It was decided that these experts would be retained directly by the King County Council in order to maintain independence and avoid either the appearance or the actuality of any conflict of interest.

Table 2. Local Jurisdiction Review Experts

King County officials requested that GBB find two public managers to act as referees on the report. King County’s Project Manager is coordinating the work of these local government reviewers, and their comments will be placed into this document by GBB upon receipt from King County.

<table>
<thead>
<tr>
<th>Gerald M. Newcombe</th>
<th>Associate Administrative Officer and former Director of the Division of Solid Waste Management San Bernardino County, California</th>
</tr>
</thead>
<tbody>
<tr>
<td>Janet Coke, P.E.</td>
<td>Waste-by Rail Division Engineer Solid Waste Management Department Sanitation Districts of Los Angeles County, California</td>
</tr>
</tbody>
</table>

Review Documents

The Waste Export Plan is the result of a four-year process, which is documented in an extensive range of documents. These documents needed to be reviewed to adequately bring the review panel up the curve on King County’s transfer and waste export plans. The review panel took a two-fold strategy to the review of these documents as part of its analysis. First, four experts (Messrs. Gershman, Bratton, Bernheisel and Anderson) were assigned to review all of the documents from a global perspective in order to provide overall continuity to the review. Second, one or two individual experts were assigned to each document with specific responsibility for distilling and drafting an opinion/analysis on the document. These assignments are shown in Table 3.

Table 3. Assignment of Documents for Review

<table>
<thead>
<tr>
<th>Document</th>
<th>Assigned Expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinance 14971</td>
<td>Frank Bernheisel, GBB and Charles Banks, RLB</td>
</tr>
<tr>
<td>Milestone Report #1</td>
<td>Bob Brickner, GBB</td>
</tr>
<tr>
<td>Milestone Report #2</td>
<td>Bob Brickner, GBB</td>
</tr>
<tr>
<td>Milestone Report #2 Addendum</td>
<td>Bob Brickner, GBB</td>
</tr>
<tr>
<td>Milestone Report #3</td>
<td>Frank Bernheisel, GBB</td>
</tr>
<tr>
<td>Milestone Report #4</td>
<td>Frank Bernheisel, GBB</td>
</tr>
</tbody>
</table>
The next step entailed four members of the review panel (Messrs. Gershman, Bernheisel, Davenport and Anderson) making a five-day visit to King County to tour existing transfer station facilities, the Cedar Hills Landfill, other solid waste facilities, and other solid waste/recycling points of interest. Direct observation of these facilities, and of the local geography and neighborhood characteristics, greatly enhanced the review panel’s understanding of the King County solid waste system. During the site evaluations, the Team made presentations to the Regional Policy Committee, Solid Waste Advisory Committee, the Metropolitan Solid Waste Management Advisory Committee, and met with members of the King County Solid Waste staff to learn more about the Division's organization and function. Prior to arriving in King County, an email was sent to every member of the Solid Waste Advisory Committee (“SWAC”) and the Metropolitan Waste Management Advisory Committee (“MWMAC”) making our Team available for interviews both during the weekday and weekend as well as by phone. Members of the Team also made site visits to the facilities of local private waste companies.

**Review Questions**

Our strategy for answering the questions is comparable to that used for our review of the related documents. Table 4 shows the questions to be answered in this report.
## Table 4. Questions

<table>
<thead>
<tr>
<th>Topic</th>
<th>Questions/Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analysis of Projections</strong></td>
<td>1. Analyze waste generation, population and waste reduction and recycling projections and their related impact to sizing transfer system, intermodal system and regional recycling processing infrastructure.</td>
</tr>
<tr>
<td><strong>Public Process</strong></td>
<td>2. Are there other methods that would enhance public/stakeholders’ participation in the facility siting process?</td>
</tr>
<tr>
<td><strong>Transfer Stations Issues and Assumptions</strong></td>
<td>3. Would varying the recycling assumptions alter the number or configuration of planned transfer facilities?</td>
</tr>
<tr>
<td></td>
<td>4. Should future publicly owned / operated facilities have space for extended recycling activities?</td>
</tr>
<tr>
<td></td>
<td>5. Do the number and location of transfer stations recommended in the Waste Export System Plan seem appropriate for King County? What changes in demographics could affect the system as configured? Are capital cost estimates in the Plan reasonable?</td>
</tr>
<tr>
<td></td>
<td>6. What are alternative options for providing compensation to host cities, such as, but not limited to, one time payments, payments based on tonnage, payments based on traffic, payments based on lost revenue? To what do we benchmark host city compensation payments – for example, lost revenue from utility tax or property tax?</td>
</tr>
<tr>
<td></td>
<td>7. Should self-haul service be provided and, if so, at what levels and how should the cost be covered?</td>
</tr>
<tr>
<td><strong>Waste to Energy</strong></td>
<td>8. Understanding that analysis of WTE will take place in the Comp Plan update process – how might including WTE technologies in King County’s solid waste strategy affect transfer station or waste export plan recommendations?</td>
</tr>
<tr>
<td><strong>Sustainability</strong></td>
<td>10. Are there models or methods for the transfer of solid waste from the point of generation to final disposal that minimize fossil fuel consumption and air pollution?</td>
</tr>
</tbody>
</table>
Stakeholder Interviews

As previously mentioned, four members of the review panel were in King County for the week of May 7, 2007. During this time, members of the panel conducted face-to-face interviews with key stakeholders and Solid Waste Division staff. This contributed to an enhanced understanding of the County objectives and issues for export of solid waste on the part of the review panel members. These interviews resulted in the identification of additional documents that the review panel members felt were germane to the review process. Because all of the experts were not present in King County for the interviews and facility tour, the documents collected, pictures taken and impressions were shared through conference calls and email.

Site visits by team members to both King County transfer stations and local private facilities were made to gain a visible sense of the on-the-ground conditions of the solid waste infrastructure King County implemented and works within.

Meeting Support

During the week of May 7, 2007, four members of the Team made presentations to the Regional Policy Committee, Solid Waste Advisory Committee, and the Metropolitan Solid Waste Management Advisory Committee. The RFP requires the GBB Team to be available to provide support for these meetings as it pertains to the intentions of this contract.

Direct Staff on Additional Analyses

The members of the review panel identified a number of areas that they felt required additional analysis. These were formulated as questions or requests and submitted to King County staff. Specific responses and additional documents were delivered to the review panel and reviewed by the appropriate panel member or members. The questions and additional analysis request by the GBB Team and the County staff response, along with the list of additional documents delivered by the King County staff to the review panel, are provided in Appendix B.

Reporting

This task includes the preparation of a draft and final report, summarizing the findings of all previous tasks. The report is to be written in ‘white paper’ format with key findings for review by a wide audience, using bullets, summary paragraphs, and references to more detailed analyses and/or source documents that were reviewed as part of the project.

The GBB Team will prepare and deliver an electronic copy of a draft report for review by the County. Upon receipt of comments, the GBB Team will incorporate comments and deliver 10 hard copies and an electronic copy of the final report in an appropriate format to be determined jointly by the Consultant and the Metropolitan King County Council project manager.

Presentations

Up to three members of the GBB Team will be available for up to three meetings to discuss the final report. For budgeting purposes, this task allows for the delivery of a final presentation at up to three meetings (elected officials, SWAC, etc.) to summarize key findings of the project.
Appendix B

Organizational Chart, Expert Firms and Experts’ Résumés

The chart below illustrates the organizational structure for the GBB Team. Those names highlighted were members of the site tour in King County during the week of May 7, 2007.

King County Council

Harvey Gershman
GBB President
Officer-in-Charge

Chace Anderson
Principal Associate
GBB Project Manager

GBB
Bob Brickner
Exec Vice President
Tim Bratton
Sr Vice President
Frank Bernheisel
Vice President

MSW
Walt Davenport
President
John Culbertson
Vice President

RLBA
R. L. Banks
President
Gershman, Brickner & Bratton, Inc., (GBB)

GBB’s professional staff includes engineers, planners, economists, environmental scientists, and policy specialists. Our commitment to excellence, the highest quality work products, and years of proven experience offer our clients the best results. When making recommendations, GBB maintains its objectivity by avoiding situations that could create a conflict of interest. GBB is independent of technology, financing, construction, and operational interests. We have earned our solid reputation by understanding our clients’ needs, and working hard to achieve their goals. Our corporate resources are committed to implementing economically sound and environmentally sustainable solid waste management systems. Areas of expertise include the following:

- Solid Waste Management Planning and Implementation
- Landfill Management
- Collection and Routing
- Full Cost Management
- Municipal, Commercial, and Industrial Recycling
- Construction Waste and Demolition Debris Recycling
- Markets Analysis
- Procurement, Evaluation, and Construction, Acceptance, and Operations Monitoring
- Community Information, Technical Assistance, and Training
- Administrative and Management Evaluations
- Waste-To-Energy Project Development
- Waste Composition and Quantity Analysis

Harvey Gershman, President

With over thirty years of experience, Mr. Gershman provides strategic advice on all aspects of waste management including Waste To Energy, Recycling Operations and Education, and Full Cost Management. His work has been instrumental in providing successful outcomes in City of Alexandria/Arlington County, VA; City of Fort Worth Texas; City/Parish of Baton Rouge, LA; Town of Babylon, NY, to name a few. Mr. Gershman coordinated the development and negotiations for a 975 TPD waste-to-electricity project to serve the City of Alexandria and Arlington County, Virginia. He conducted the preparation of a strategic plan of these Jurisdictions relationship with its WTE contractor, Ogden Martin Systems of Alexandria/Arlington, Inc. Mr. Gershman was the management consultant to the Northeast Maryland Waste Disposal Authority for is procurement and development of the 2,250 TPD cogeneration plant to replace the former Pyrolysis Plant in Baltimore, Maryland. Mr. Gershman was Project Manager on a project leading to the development, implementation, and management of a District Energy System for the Metropolitan Area of Nashville and Davidson County, Tennessee. He led not only the strategic planning, business development, but negotiations with Governor Bredesen’s Administration, the Mayor’s Office, a forty-member City Council, and private owners of the major buildings receiving heating and cooling from this new system.
Bob Brickner, Vice President

As with Mr. Gershman, Mr. Brickner is one of the three founders of the organization. Mr. Robert Brickner, GBB Executive Vice President, has more than 34 years of experience in the solid waste management field. He is an expert in solid waste handling systems, including collection and processing equipment, especially equipment costs and systems analysis. Mr. Brickner is well versed in cost allocation methods and economic/financial modeling, and life-cycle costing. Mr. Brickner has served as the lead evaluator for GBB on many systemwide evaluations and vendor solicitations, and as lead negotiator on numerous projects that have been financed. He has authored independent reports for bond sales and has made supportive presentations to rating agencies on Wall Street. Mr. Brickner has presented expert witness testimony at arbitration proceedings and permit hearings on waste-related programs.

Tim Bratton, Senior Vice President

Timothy Bratton is a Senior Vice President and co-founder of GBB in 1980. Mr. Bratton brings substantial expertise in resource recovery and solid and hazardous waste management to the firm: over 30 years’ experience in project planning, procurement, economic analysis, and financing. He has managed and directed numerous recycling, resource recovery, and landfill feasibility studies; comprehensive solid waste management plans, full cost accounting studies, privatization evaluations, and independent cost analyses; due diligence investigations and environmental site assessments for facility acquisition; served as a key adviser in the planning and procurement of several modern waste management facilities now in operation; trained many solid waste professionals; and authored and co-authored numerous papers, studies, guides, and a book.

Frank Bernheisel, Vice President

Frank Bernheisel, GBB Vice President, has over 29 years experience in solid waste and resource recovery planning and development using the technologies of recycling, composting, materials recovery, and waste-to-energy. He has managed a wide range of projects, including program and business planning, feasibility studies, contract development and negotiation, and engineering. He has extensive experience in the marketing of products resulting from recovery. Mr. Bernheisel has published extensively and made presentations to elected officials and professional staff members of federal, state, and local governments, as well as senior executives of major industrial corporations. In addition, Mr. Bernheisel has a wide range of experience in many facets of business planning, marketing, and operations analysis. Prior to his association with GBB, Mr. Bernheisel was Vice President for Planning of Telemet America, Inc.; Director of Demonstration Programs for the National Center for Resource Recovery, Inc.; and a scientific staff member of The MITRE Corporation and Booz-Allen Applied Research, Inc.

Chace Anderson, Project Manager

Mr. Anderson has nearly 20 years experience in the solid waste management field from owning his own recycling collection company to being a Director of Solid Waste and Heavy Equipment Garage for the Metropolitan Government of Nashville and Davidson County. There he managed the development and implementation of a solid waste management plan valued at approximately $80 million. This plan lowered the annual operating budget from $33 to $24 million while also increasing services to the jurisdiction.
MidAtlantic Solid Waste

MidAtlantic Solid Waste (MSW) Consultants was formed in 1992 as a direct result of the waste industry consolidation that took place among private sector waste management companies. Walt Davenport established the company with an objective to help public and private sector solid waste organizations intelligently evolve with the industry, meet administrative and financial needs, improve efficiency, establish effective contracts and apply best practices to their solid waste management systems. The firm specializes in collection efficiency, collection contract and franchise procurement services, waste composition and generational analysis, recycling, and financial analysis.

Walt Davenport, President

For over 30 years, MSW Consultants founder and President, Mr. Walt Davenport, has worked in the public and private sectors of the solid waste management industry as a team leader, technical expert, operations specialist, and problem solver. His early career in the private sector was characterized by his ability to increase productivity and profitability, improve customer and employee satisfaction, and negotiate and manage contracts. Since the early 1990s, Mr. Davenport has shifted his consulting focus by assisting dozens of state, county, and city clients across the nation while working as a subcontractor to larger national consulting firms.

John Culbertson, Vice President

For 14 years, Mr. Culbertson has provided waste management and information management consulting services to federal, state, county and city governments and organizations across the nation. His expertise encompasses all aspects of the waste management industry, including collection efficiency and routing; transfer and long-haul logistics; solid waste system planning and strategic analysis; financial analysis and system funding; procurement assistance and contract negotiations; MRF operations and efficiency; waste stream and waste generation analysis; and a wide range of information management and statistical analysis. Mr. Culbertson was the lead database architect and data manager for several large-scale national information management projects targeting solid waste industry issues, and he has managed technical staff in the design, development, and implementation of numerous data-intensive and statistical projects.


R.L. Banks & Associates, Inc., has 50 years of nationwide, railroad economics, cost analysis, operations planning and engineering analysis and counsel. The firm has significant waste-by-rail feasibility and implementation experience in San Diego, Salt Lake City, Los Angeles, San Francisco, Northeast Maryland Waste Disposal Authority, Northern New Jersey, and GE's Hudson River Superfund Site.

Charles H. Banks, President

Mr. Banks has been president since 1985 and has provided passenger service implementation and railroad line access counsel to more than a dozen clients. On behalf of seven public sector clients including the Los Angeles, Orange and Riverside County Transportation Commissions, and the Maryland MTA, Mr. Banks has completed or is presently undertaking or directing prospective line sale tasks including evaluating alternative access arrangements, valuations and title research. In the eleven years before joining RLBA, Mr. Banks was responsible for intercity, commuter rail and joint terminal operations at the United States Railway Association, and worked in the Strategic Planning and Finance Departments at Conrail, the Executive Department at SP and two other carriers.
Appendix C

GBB Team Questions and Additional Analysis Requests, County Response, and Additional Documents Provided and Reviewed

**ADDITIONAL DOCUMENTS EVALUATED:** When the GBB Project Team made site visits in early May 2007, it requested further documents from the Solid Waste Division. These documents were distributed to team members and reviewed for inclusion in the answers to King County’s ten questions. These documents were:

- Solid Waste Rate Study, 2005-2006 March 2004
- “Fund Balance” (pages)
- “A Practical solid Waste Tipping Fee Development Model” Thomas T. Karton
- “Houghton Transfer Station History” – May 2007
- Executive Proposed: Solid Waste Disposal Fees 2008-2010
- Solid Waste Division 2007 Adopted Budget January 2007
- 2006 Facility Master Plan Update Bow Lake Transfer/Recycling Station February 2007
- D.8. Draft Supplemental Environmental Impact Statement
- Final 2001 Comprehensive Solid Waste Management Plan 2001
- D.12. Recycling & Waste Export System Plan
- D.11. Solid Waste Facility Siting Plan
- Final Supplemental Environmental Impact Statement Sept 2006
- D.1. Ordinance 14971
- D.2. Milestone Report #1
- D.3. Milestone Report #2
- Black River Recycling and Transfer Station rate schedule
- Solid Waste Transfer and Waste Export System Plan Sept 2006
- D.4. Milestone Report #2 Addendum
- D.4. Milestone Report #3
- D.6. Milestone Report #4
- D.7. Ordinance 2006-0263
- Estimated Per Ton Cost
- Solid waste division financial Plan
- Solid waste rate comparison
- “Rabanco Brochure”
COUNTY RESPONSE: Upon reviewing the documents and visiting the sites, a list of questions was provided to King County’s Solid Waste Division. The Solid Waste Division responded to the questions in the memorandum on the following pages.