

MMHAT Decommissioning Case Studies and Issue Assessment

Final Report

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Heartwood ReSources

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Executive Summary

This report summarizes a series of case studies on the decommissioning and resale of mobile, manufactured homes and trailers (MMHATs). The purpose of the case studies is to identify the characteristics of successful operations and provide insights with respect to the feasibility of establishing an operation in Douglas County, Oregon.

Findings

History of MMHATs

Today's manufactured homes are descendents of the recreational "pull-behind" trailers of the 1930s and 40s, yet look little like their predecessors in either form or fashion. By 1960, 1.3% of the entire U.S. housing stock and 2.3% of Oregon's housing stock was comprised of mobile homes and trailers. In fact, the number of mobile and manufactured homes rose 1000% from 1960 to 2000, with most of that growth happening in the 1970s and 80s.

In June 1976, the federal government instituted the Federal Manufactured Home Construction and Safety Standards Act. This building code, administered by the U.S. Department of Housing and Urban Development (HUD) and known as the HUD Code, regulates manufactured home design and construction, strength and durability; fire resistance; and energy efficiency.¹

Table 1 reflects the number of structures taxed in Coos, Curry, and Douglas Counties in 2004. Coos County figures do not account for structures that were conditioned title exempt, which includes those that are permanently affixed to foundations.

Table S-1: Total MMHATs by County

County	2004 Assessors Totals
Coos	4,318*
Curry	3,853
Douglas	12,905

*Does not include title exempt structures

¹ According to the Department of Housing and Urban Development, homes built before June 15, 1976, are referred to as "mobile homes" whereas those built after that date are referred to as "manufactured homes." However, many people still use the former term to describe even today's most modern structures (much to the manufactured housing industry's chagrin).

Regulatory Framework

Without an identified precedent in Oregon, Heartwood ReSource's proposed MMHAT salvage facility will likely undergo close scrutiny by the state and county during the permitting process. There are two ways that the facility may be regulated by the state: as a Material Recovery Facility or as a Junkyard/Salvage Yard. Douglas County will likely regulate the facility as a Salvage Yard. How the facility is defined has implications for siting, permitting, and operation.

Evaluation of Operational Issues

Heartwood faces a number of operational decisions if it decides to move forward with an operation. These include:

- Methods of obtaining and evaluating MMHATs
- Financing and fees
- Insurance
- Markets for reclaimed materials
- Transporting MMHATs
- Deconstruction methods
- Hazardous materials

Heartwood will need to evaluate each of these issues and develop a set of operational strategies and policies that address them.

Case Study Findings

CPW conducted case studies of five MMHAT decommissioning operations throughout the U.S. Table S-2 summarizes key findings from the case studies.

Table S-2. A Comparison of Deconstruction and Salvage Operation Case Studies

Case Study and Geographic Service Area	Type of Operation	Years in Existence	# MMHATs Processed	Business Model	Deconstruction and Salvage Methods	Materials Salvaged/ Markets	Outcomes	Advantages & Limitations
Tomorrow's Home Foundation Madison, WI (Statewide)	Non-Profit Program; run by statewide non-profit organization	2000-2002	~300 total	State and Manufactured Housing Industry funding; MMHATs donated; on-site and at-facility processing.	Hired 3 contractors that used a range of methods.	Metals	30% diversion rate; program no longer operating.	Advantages: Manufactured Housing Industry and State funding Limitations: Asbestos certification costs
Keep Liberty County Beautiful Liberty County, GA (Countywide)	Non-Profit Program; affiliate of national non-profit organization	2004-Present	~100 total	Local government and individual funding; MMHAT owners pay small amount (\$100-\$300); on-site processing.	Hires two different contractors based on needs—one does all by hand, the other uses some machinery.	Metals, wood, reusable items	60% diversion rate; Smaller jurisdictions in county are working with program following success in county seat	Advantages: Public/private donations; nuisance abatement ordinances; low wages Limitations: Dependent upon donations
Salvage King Staley, NC (Multi-State Region)	For-Profit Deconstruction & Salvage Business	1998-Present	~100/yr	Self-funded; MMHAT owners pay; on-site and at-facility processing.	Mostly by hand, used to be more mechanized.	Metals, wood, reusable items (~25 miles and at facility)	70-75% diversion rate; MMHAT deconstruction & salvage not currently profitable.	Advantages: High volume; insurance contracts; nuisance abatement ordinance. Limitations: Accumulation of salvaged goods; MMHAT salvage not currently profitable.
CMH Mobile Homes Saginaw, MI (Mid-Michigan Region)	For-Profit Deconstruction & Salvage Business	2004-Present	~60 total	Self-funded; hauling companies pay; mostly at-facility processing.	80% Hand 20% Mechanical	Metals, wood, reusable items (~30 miles and at facility)	30-40% diversion rate; not currently profitable but getting closer.	Advantages: Court-ordered clean ups; low wages; high tipping fees (\$1175); close markets. Limitations: Not yet profitable.
Zanker Materials Processing Facility San Jose, CA (Multi-County)	For-Profit Construction & Demolition Landfill and Materials Processing Facility	Landfill (1982-present) MPF (1999-present)	10-15/month	Private investments; hauling companies pay (\$95/ton, \$8/tire, \$30/appliance); at-facility processing only.	Highly mechanized; hand sorting as well.	Metals, wood, gypsum, some plastics (~20 miles and at facility)	80-90% diversion rate; profitable operation.	Advantages: AB 939; economies of scale; close markets; manufactured housing industry incentives; high volume. Limitations: ?

Key Considerations

The diversity of the case studies reviewed in this report demonstrates that there is no one right way to run a MMHAT deconstruction and salvage operation. For every aspect of an operation, including financing, obtaining MMHATs, and deconstructing the structures, there are alternative strategies to choose from. Choosing the methods to employ should be based on the goals and capacity of the organization that is undertaking the operation. Selecting appropriate strategies will also depend on assessing the unique opportunities and limitations that are available to a given deconstruction and salvage operation because of its location.

Recommendations

The case studies illustrate a number of ways that public policies and private initiatives can support MMHAT salvage and recycling operations. These examples provide lessons for what conditions and partnerships could be particularly instrumental in supporting Heartwood's proposed operation. CPW developed the following recommendations in light of the current policies and opportunities that prevail in Douglas County and the state of Oregon.

1. Tipping Fees

In order for Heartwood to successfully command a fee from Douglas County homeowners for the service of accepting their unwanted MMHATs, the county landfill must charge tipping fees for construction and demolition waste. Otherwise, the option to dispose of an entire MMHAT in a landfill will be a cheaper alternative (and therefore a more attractive option) than engaging Heartwood to deconstruct and salvage its components.

2. Enforcement of Regulations

State regulations that require landfills to accept only structures that are certified as asbestos free must be enforced. Heartwood's operation will be subject to the expenses of asbestos testing. In order for Heartwood to compete with landfills for unwanted MMHATs, enforcement of these regulations must be equitable.

Local jurisdictions can support Heartwood's operation by acting as a referral service when MMHAT owners inquire about how to dispose of their structure. Jurisdictions can also persuade owners to bring unused structures to Heartwood by enforcing zoning regulations where multiple structures are illegally located on one lot. Alternatively, jurisdictions that provide electrical, gas, or water service can be encouraged to adopt a strategic policy of not providing service to new MMHATs on lots that still have old residential MMHATs sited on the property.

Jurisdictions can also contract Heartwood to deconstruct and salvage MMHATs when they acquire structures by court order. Enforcement of

nuisance abatement ordinances and taxation related foreclosures are two ways in which jurisdictions are likely to assume responsibility for removal an MMHAT.

It should be noted that these strategies are dependent on jurisdictions having sufficient funding for oversight and enforcement. It is also important to understand that an unintentional consequence of these types of enforcement can be displacement of and financial burden upon low-income residents.

3. Support by Manufactured Housing Industry

Heartwood should seek the support of the Oregon Manufactured Housing Industry to help fund the deconstruction and salvage operation. Other state manufactured housing associations have supported similar programs due to their interest in removing unsightly MMHATs from the landscape. The Oregon association could similarly benefit the reputation of manufactured housing by investing in Heartwood's pioneering program.

4. Support by State and Local Jurisdictions

Heartwood should seek financial support for the deconstruction and salvage operation from both the state and local jurisdictions that will benefit from Heartwood's efforts. The Oregon Department of Energy will benefit from Heartwood's deconstruction and salvage operation because of their interest in removing energy inefficient structures from the grid.

The Oregon Department of Environmental Quality may have a two-fold interest in Heartwood's efforts. First, the DEQ may encounter the need to dispose of abandoned MMHATs in the course of doing environmental clean-up of sites around the state. Heartwood's operation would almost certainly provide the DEQ with an alternative that is preferable to disposal of these structures.

Secondly, the DEQ is responsible for the Opportunity to Recycle program which set a statewide recovery goal of 45% by 2005. Supporting Heartwood would further the Opportunity to Recycle goal. Local jurisdictions have a similar incentive to support Heartwood, as they are also committed to furthering salvage and recycling under the Opportunity to Recycle legislation.

If Oregon mandated recovery levels, rather than setting target goals, as has been done in California (AB 939), the government would have an even greater incentive to support Heartwood's deconstruction and salvage operation.

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Chapter 1

Introduction

This report summarizes a series of case studies on the decommissioning and resale of mobile, manufactured homes and trailers (MMHATs). The purpose of the case studies is to identify the characteristics of successful operations and provide insights with respect to the feasibility of establishing an operation in Douglas County, Oregon.

Background

Older mobile, manufactured homes and trailers (MMHATs) throughout the state pose various problems to a variety of parties including their owners, utility companies, local governments, and even the manufactured housing industry. Chief among these problems are the high costs to heat and cool many of these “tin-box” structures, the health and safety hazards resulting from outdated construction standards, and the poor image reflected on the industry and communities from structures that have been poorly maintained.

The State of Oregon is keenly aware of the issues surrounding aging MMHATs, and momentum is building to deal with the situation. The state is offering financial incentives to encourage owners to purchase new, more energy efficient manufactured housing. The manufactured housing industry, State Department of Energy, and utility companies have teamed up to provide reimbursements to people willing to trade in their old MMHATs for new manufactured homes. Low interest rates on loans have also begun to entice people to discard their old “energy hogs.”

As these and other efforts begin to take hold, and as older homes continue to deteriorate, the steady stream of MMHATs that are currently headed into landfills across the state will certainly intensify. This will put increasing pressure on the state’s landfills and significantly reduce their life spans. Some figures estimate that there may be between 80,000 and 100,000 obsolete MMHATs in the state weighing approximately 450,000 tons.² If all of these structures were disposed of in one year, it would increase the state’s total yearly waste

² Estimate based on Douglas county percentage of pre-HUD (obsolete) MMHATs applied to total number of MMHATs in Oregon and a recent study by the Vermont Department of Natural Resources which claims that an average MMHAT weighs six tons. Vermont Agency of Natural Resources; Town of Bristol, Vermont; and Manufactured Housing Institute. *A Feasibility Study of Mobile Home Recycling*. 2000.

disposal by 12.4% to 15.6%.³ These are hypothetical calculations, however, they show the potential for the large quantity of MMHAT waste, as well as potential reusable and recyclable resources in the state.

Heartwood ReSources

Heartwood ReSources (Heartwood), a 501(c)(3) subsidiary of Umpqua Community Development Corporation, uses an environmental stewardship and economic development strategy to reduce the impact on Douglas County, Oregon's landfill and to help keep housing rehabilitation and energy costs affordable for low-income homeowners. Heartwood is both a used building materials retail outlet and a recycling company that provides professional deconstruction, salvage, rehabilitation, and weatherization services for low-income residents in Coos, Curry, and Douglas Counties. Specifically, the organization strives to enhance the livability of southwest Oregon by implementing their mission:

- To educate the public regarding (i) environmental deterioration caused by solid waste and (ii) the benefits and process of recycling building materials that would otherwise be deposited in landfills;
- To combat environmental deterioration attributable to construction and demolition debris by reclaiming and diverting usable building materials from Oregon landfills;
- To provide job training for low-income individuals in Douglas County, Oregon, including participants in Temporary Aid to Needy Families and formerly incarcerated individuals; and
- To promote the retention of affordable housing through the maintenance and rehabilitation of structures utilizing salvaged building materials.

Until now, Heartwood's salvage efforts have been focused on traditional site-built homes and buildings. Currently, Heartwood is considering expanding its services to include the dismantling, salvage, and recycling of obsolete MMHATs. It is in the process of conducting a market and feasibility study to determine the viability of such an operation.

Purpose and Methodology

Heartwood contracted the Community Planning Workshop (CPW) to conduct background research and case studies on MMHAT recycling

³ Based on the Oregon Department of Environmental Quality reporting 3,857,969 tons of waste in 2003. Oregon DEQ website:
<http://www.deq.state.or.us/wmc/solwaste/documents/disposalstatusreport2004.pdf>

programs and practices occurring across the country. Specifically, CPW was charged with:

- Documenting conditions influencing the decommissioning of MMHATs statewide;
- Estimating the number of MMHATs in Douglas, Coos, and Curry Counties;
- Identifying the reusable and recyclable components of MMHATs;
- Performing case studies on salvage and recycling programs and businesses throughout the country; and
- Examining policy and environmental issues affecting potential MMHAT salvage and recycling operations in Oregon.

To complete this study, CPW performed an extensive literature review using books, newspaper and journal articles, Internet sources, government documents, and personal interviews to gather information about relevant policies, industry conditions, and important stakeholders. In addition to the literature review, CPW also contacted representatives from the manufactured housing industry and recycling associations to identify potential case studies. The most pertinent case studies were selected with the direction of Heartwood, and interviews began in March of 2005. CPW conducted interviews with owners and operators of deconstruction and recycling companies; nonprofit program directors; independent contractors, including haulers and hazardous materials handlers; and government representatives.

Organization of the Report

This report is organized into 6 chapters and 3 appendices. There is also an accompanying Resource CD that includes forms and regulations that may apply to Heartwood's proposed facility. The Chapters include the following:

Chapter 2: The History of MMHATs in the U.S. and Oregon provides an overview of trends in MMHAT development and regulation.

Chapter 3: Regulatory Framework describes key Oregon statutes and administrative rules that govern disposal of solid waste.

Chapter 4: Evaluation of Operational Issues presents a discussion of issues related to the establishment of a MMHAT deconstruction and salvage operation in Douglas County.

Chapter 5: Case Studies of MMHAT Decommissioning Operations presents findings from CPW's review of similar operations throughout the U.S.

Chapter 6: Recommendations offers suggestions for how private and public entities can leverage support for the establishment of a MMHAT deconstruction and salvage operation in Douglas County.

This report includes the following 3 appendices:

Appendix A: Tomorrow's Home Foundation Legal Form

Appendix B: Keep Liberty County Beautiful Legal Form

Appendix C: Keep Liberty County Beautiful Tax Form

Appendix D: Exploded Drawing of Angeles Mobile Home

A Resource CD accompanying this report includes the following:

1. Lane County Demolished Building/Mobile Home Form
2. OAR 340-096-0040 "Transfer Stations and Material Recovery Facilities"
3. Douglas County Code 3.22 "(M-3) Heavy Industrial"
4. DEQ Application for a New Solid Waste Disposal Site Permit
5. DEQ Instruction Sheet: Application for Material Recovery Facility and Transfer Station Permit
6. DEQ Land Use Compatibility Statement Form
7. DEQ Instructions for Completing the Application for a Solid Waste Letter of Authorization
8. DEQ Fact Sheet: Oregon Recycling Laws
9. DMV Application for Vehicle Transporter Certificate
10. DCBS Manufactured Structure System (LOIS) User Application
11. DCBS Certification of Possessory Lien Foreclosure Statement
12. Morbark Predator Shredder Product Information
13. Oregon Accredited Asbestos Training Providers List
14. DEQ/DCBS Asbestos-Rules of Abatement Publication
15. DEQ Notification Forms for Asbestos Abatement

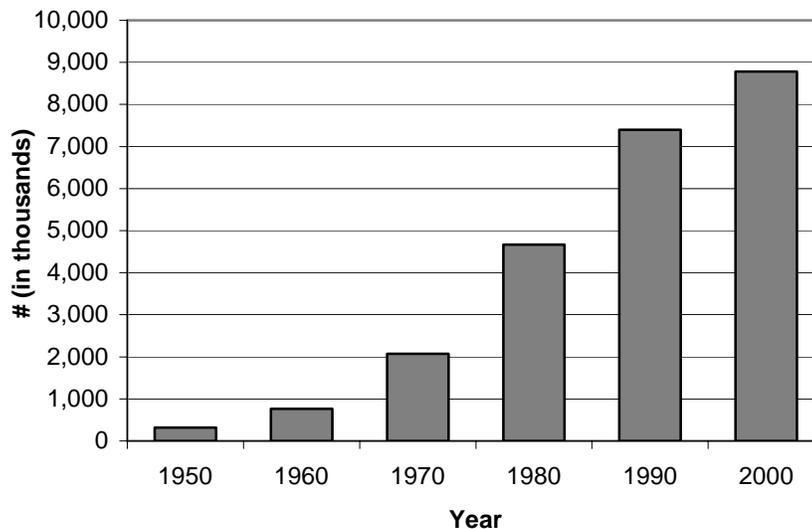
Chapter 2

The History of MMHATs in the U.S. and Oregon

Today's manufactured homes are descendents of the recreational "pull-behind" trailers of the 1930s and 40s, yet look little like their predecessors in either form or fashion. In the 1950s, the famed rectangular "singlewide" structure supplanted the old nomadic style and became a more permanent fixture on the American landscape. By the late 1950s, the Federal Housing Administration recognized "mobile homes" as a type of housing suitable for mortgage insurance.⁴ By 1960, 1.3% of the entire U.S. housing stock and 2.3% of Oregon's housing stock was comprised of mobile homes and trailers. Their popularity continued to rise over the next few decades due primarily to their affordability (as compared to site-built homes) and short production time. In fact, the number of mobile and manufactured homes rose 1000% from 1960 to 2000, with most of that growth happening in the 1970s and 80s (See Figure 1).

Figure 1: MMHATs in the U.S. 1950-2000

Source: U.S. Census



⁴ Weitz, Jerry. "Manufactured Housing: Trends and Issues in the 'Wheel Estate' Industry." American Planning Association Journal. Winter 2004.

The HUD Code

June 15th, 1976 marks a historic date for the MMHAT industry. On this date, the federal government instituted the Federal Manufactured Home Construction and Safety Standards Act. This building code, administered by the U.S. Department of Housing and Urban Development (HUD) and known as the HUD Code, regulates manufactured home design and construction, strength and durability; fire resistance; and energy efficiency.⁵ MMHATs built prior to the enactment of this code, were not held to uniform standards, which in many instances led to poor construction and short life spans. Every HUD Code manufactured home is built in a factory, under controlled conditions, and has a special label affixed on the exterior of the home indicating that the home has been designed, constructed, tested, and inspected to comply with the stringent federal standards set forth in the code. No manufactured home may be shipped from the factory unless it complies with the HUD Code and receives a certification label from an independent third party inspector.

In 1994, this building code was revised to enhance energy efficiency and ventilation standards and to improve the wind resistance of manufactured homes in areas prone to hurricane-force winds. The enhanced wind resistance requirement was a direct response to Hurricane Andrew, which, in 1992, devastated a number of mobile and manufactured home communities in Florida and South Carolina. This rule resulted in some modest shifts in design and materials used to fasten roofs to the body of the home.⁶ Six years later, the Manufactured Housing Improvement Act of 2000 established a more timely and systematic approach to make code updates and enhancements for manufactured homes.⁷ The effect of these amendments makes manufactured home regulations more similar in standard to site-built homes.

Current Trends

By the 2000 Census, 8.4% of the U.S. housing stock and 10.3% of Oregon's housing stock were accounted for by "mobile homes".⁸ This

⁵ According to the Department of Housing and Urban Development, homes built before June 15, 1976, are referred to as "mobile homes" whereas those built after that date are referred to as "manufactured homes." However, many people still use the former term to describe even today's most modern structures (much to the manufactured housing industry's chagrin).

⁶ Richards, Curtis. Palm Harbor Homes, Marketing and Sales Director. Millersburg, Oregon. Personal Interview. May 17, 2005.

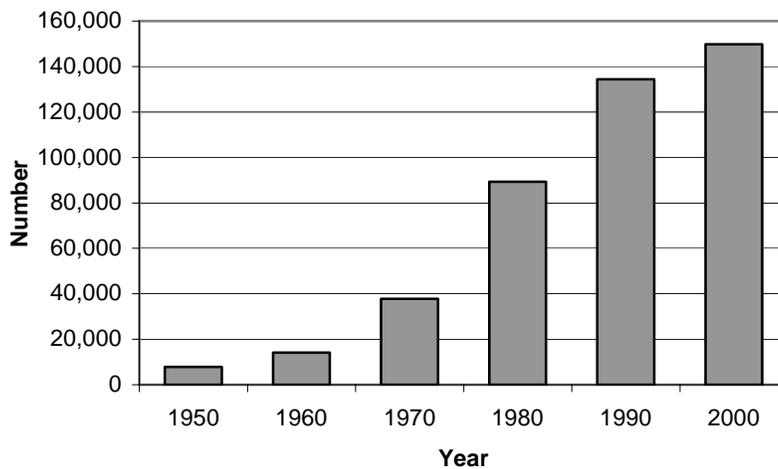
⁷ Manufactured Housing Institute web page:
http://www.manufacturedhousing.org/media_center/quick_facts2005/hud_code.htm

⁸ Persons completing the Census have the option to select "mobile home" as the best description of their dwelling. "Manufactured home" is not an option. The Census count may

ranks Oregon 20th in the U.S. for percentage of all housing stock (South Carolina, New Mexico, and West Virginia had the greatest percentage) and 23rd for total number (Florida, Texas, and North Carolina had the most).⁹ Multi-section homes (those having two or more connectable sections that combined measure 16' or wider) have all but replaced the classic singlewide style. The larger and more ornate doublewide and triplewide manufactured homes account for about 80% of the manufactured homes being sold in the U.S. today. In 2003, approximately 131,000 manufactured homes were sold nationwide, equal to roughly 8% of all new homes (down from a high of 24% in 1997).¹⁰ According to the Manufactured Housing Institute, 2,492 (approximately 2%) of them were shipped to Oregon residents in 2003.¹¹

Figure 2: MMHATs in Oregon 1950-2000

Source: U.S. Census



After a relatively slow start in the 21st century, Oregon has begun to show an increase in MMHAT sales. Industry experts suggest this may be due to Oregon exiting a recession quicker than much of the rest of the country.¹² No matter the case, many consumers still find that manufactured homes offer an affordable and attractive alternative to traditional site-built homes and come with nearly the same adornments

therefore include some manufactured homes depending on how respondents chose to characterize their dwelling.

⁹ U.S. Census 2000.

¹⁰ Manufactured Housing Institute web page:
http://www.manufacturedhousing.org/media_center/quick_facts2005/home_ship.htm

¹¹ Oregon Manufactured Housing Association *Oregon Manufactured Home Shipment and Production Data Report*. May 25, 2005.

¹² Miner, Don. Oregon Manufactured Housing Association. Personal Interview. May 12, 2005.

and amenities. And, since manufactured homes are factory-built, they reduce the owner's move-in time substantially, making the option to buy one even more attractive. The average completion time of a manufactured home, from initial order to move-in, is roughly three months—compared to an average completion time of about six months to a year for a site-built home.¹³ These manufactured homes are then placed either on the owner's private property or on leased land in mobile home parks. According to estimates, approximately 33% of all MMHATs across the US and Oregon are found in mobile home parks (down from approximately 50% in 1970.)¹⁴

It is difficult to find an up-to-date and accurate count of MMHATs in each of Oregon's counties. The U.S. Census only counts the number of "mobile homes" every ten years,¹⁵ and notable record keeping inconsistencies exist among participating state agencies. Historically, both the Oregon Department of Motor Vehicles (DMV) and county assessor's offices have provided estimates on the number of structures throughout the counties. Up until 2005, the state considered MMHATs as vehicles and directed the DMV to maintain records of titles, licenses, and trip permits for all mobile and manufactured homes sold within the state. This was changed, however, in May 2005, as voters overwhelmingly approved the transfer of duties and functions related to the regulation of manufactured structures, as well as taxes and fees, to the State Department of Consumer and Business Services (DCBS).

Counties, which now act as agents for the DCBS and maintain all records after the initial sale, have traditionally recorded their own information on taxable structures through their assessor's office. In the past, the DMV has sent its data to counties for cross-comparison. In talking with county officials, however, these DMV records are too cumbersome and time-intensive to crosscheck and are often ignored. Both county and DCBS officials indicated that the DMV figures are inaccurate due to recording errors and to the fact that, between 1992 and 1999, DMV purged large quantities of MMHATs from their database because of inactivity.

County and DCBS officials maintain that county figures are the most reliable and, for purposes of this paper, we will refer to those figures. Table 1 reflects the number of structures taxed in Coos, Curry, and Douglas Counties in 2004. Coos County figures do not account for

¹³ Bob Vila's Home Site web page: www.bobvila.com

¹⁴ Housing Assistance Council web page: www.ruralhome.org

¹⁵ The Census only counts mobile homes used for housing. Mobile homes used for business purposes or for extra sleeping space and mobile homes for sale on a dealer's lot, at the factory, or in storage are not counted in the Census housing inventory. Additionally, since the Census's classification of housing as a mobile home is self-selected by respondents, the Census counts may differ from other record keeping agencies.

structures that were conditioned title exempt, which includes those that are permanently affixed to foundations.

Table 2: Total MMHATs by County

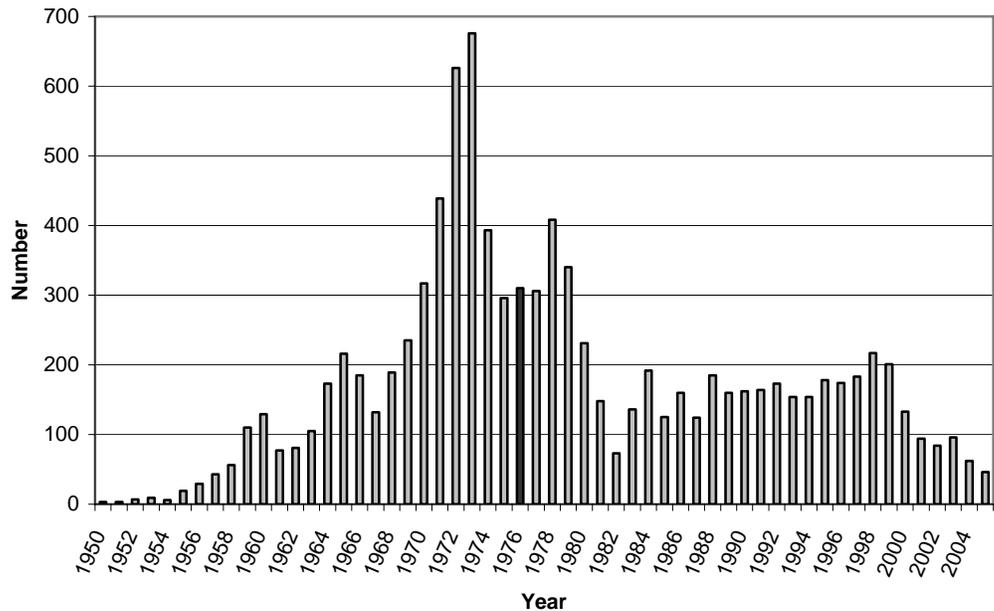
County	2004 Assessors Totals
Coos	4,318*
Curry	3,853
Douglas	12,905

*Does not include title exempt structures

Figure 3 shows the number of MMHATs in Douglas County in 2004 according to the year the structure was built.¹⁶ Forty-nine percent of non-exempt MMHATs on the 2004 tax roll in Douglas County were built prior to the date the HUD Code went into effect. Of the homes built in 1976, it may be assumed that approximately half were constructed prior to June 15th of that year, and therefore were not required to meet HUD Code standards. Douglas County does not keep year-built records for title exempt MMHATs, which number 3,188. However, we can assume that the age breakdown for those MMHATs would follow a similar trend as that shown in Figure 3.

¹⁶ For purposes of this report, we limited our analysis to Douglas County, where the majority of MMHATs in the region are located. Additional database information on Coos County MMHATs can be accessed from Tamara Houghton at the Coos County Assessor's Office: (541) 396-3121 x300 or e-mail: ccaodadpm@co.coos.or.us; information on Curry County MMHATs can be accessed from Bill O'Connor in the Curry County Computer Department at (541) 247-3371.

Figure 3: MMHATs by Year Built in Douglas County, Oregon
 (Does not account for 3,188 title exempt units)



Another way of classifying the MMHATs in Douglas County is by their width. In 2004, between 80-90% of pre-HUD structures in Douglas County were singlewides measuring 8 to 14' wide. Approximately 40% of the structures built from 1976 to the mid-80s were made up of doublewides measuring at least 20'. Such structures can be assumed to weigh and contain nearly twice as much material as a singlewide. Since the 1980s, the popularity of doublewide and triplewide structures has continued to grow.

The “Super Good Cents” Program

In the Northwest, a market-based program called Super Good Cents has had additional impacts on the industry. Home manufacturers, the region’s electric and gas utilities, and the Northwest states have teamed up to offer home buyers certified energy-efficient manufactured homes. Every manufacturer in Oregon, Idaho, and Washington, as well as a few in California and Canada, can build certified Super Good Cents Homes.

Since its inception in 1987, more than 130,000 manufactured homes have been built to this standard. A few of the features in certified homes include: added insulation in the ceiling, walls, and floors; ventilation systems; better air seals; energy efficient windows and doors; tested and sealed heating ducts; insulated and sealed skylights; R-8 crossover ducts; and sealed marriage lines between sections.

Energy-efficiency levels for Super Good Cents manufactured homes exceed the national HUD code by 40%. There are more than 60 utilities in the Northwest offering rebates to buyers of Super Good Cents manufactured homes.¹⁷ The Oregon Department of Energy has been advocating this program as a way to replace the energy “hogs” of previous eras that cost both owners and utility companies money. As these and other efforts take hold, the inevitable result will be a multitude of MMHATs destined for landfills throughout the state.

Decay and Disposal of MMHATs

MMHATs have traditionally been understood as having significantly shorter life spans than site-built homes.¹⁸ However, these figures can vary depending upon the location of the structure relative to major natural hazards, its maintenance, and depending on whether or not it is on a foundation. Some of the most common threats to the functionality of MMHATs include severe weather-related events such as hurricanes, tornadoes, wildfires, and flooding, as well as human-caused destruction and natural deterioration. Though Oregon does not face the dangers of hurricanes and tornadoes like states in the South and Midwest, Oregonians must deal with occasional flooding, wildfire, and the insidious effects of long winter rain and snow.

The following presents the various options available to an owner when his/her MMHAT has lost its functionality—including rehabilitation, conversion to secondary use, trade-in, disposal, and abandonment or other illegal activities.

Rehabilitation

As MMHATs deteriorate, owners often face issues such as floorboard rot, broken fixtures and other components, malfunctioning electrical circuitry, or even more severe structural problems. Unfortunately, in Oregon, which has one of the highest poverty rates in the nation, many MMHAT owners may not have the resources to make necessary repairs, leading the homes to an expedited demise.¹⁹ Programs exist throughout the country that provide financial and physical assistance to homeowners to help rehabilitate, renovate, and sometimes even replace their decaying MMHATs.

In Deschutes County, Oregon, the Central Oregon Community Action Agency Network (COCAAN) initiated such a program. Their process is

¹⁷ “Ask the Expert.” *The Sunday Oregonian*. February 29, 2004.

¹⁸ Gleeson, Michael E. “The Expected Life of Mobile Homes.” *Socio-Economic Planning Science*. Vol. 22, No. 6, pp. 271-276, 1988. This study put the expected life span of MMHATs built between 1976-1980 at 14-19 years.

¹⁹ Any local efforts to refurbish a MMHAT must be done in accordance with Chapter 7 of the Oregon Manufactured Dwelling and Park Specialty Code. Oregon Building Codes Division website: <http://www.cbs.state.or.us/external/bcd/>

expensive and COCAAN requires significant support through various organizations. Besides high costs associated with such programs, there can be other limiting factors affecting such initiatives. For example, some states, such as North Carolina, have rules against doing certain renovations to pre-HUD Code homes.

Secondary Uses

Often, when an MMHAT has been deemed uninhabitable, the owner may decide to use the building for other purposes. Some of the common secondary uses of MMHATs in Oregon include storage units and housing for farm animals. Other uses may include work sheds, break rooms on company sites, feeder barns, hunting huts, and many more.²⁰

MMHATs that have been converted to secondary uses remain on county tax rolls in Oregon, however property taxes may be reduced. To be eligible for such a tax reduction, the county may require the owner to remove certain plumbing and cooking fixtures, such as sinks, bathtubs, and stoves, to ensure that the structure will not be used as a residence.²¹ Coos, Curry and Douglas Counties do not keep count of how many MMHATs have been converted to secondary use.

Trade-Ins

The manufactured home industry has an interest in reducing the visibility of decaying and obsolete MMHATs, and replacing them with more modern and attractive versions available today. Some manufactured home dealers offer MMHAT owners the option to trade in their old structure for money toward a new manufactured home. This program acts to encourage people to buy new homes while simultaneously removing the old structures from the public eye. Owners may receive \$2,000-\$10,000 in trade, depending on the structure's condition. The dealer will then attempt to sell the old MMHAT on wholesale or retail for \$5,000-\$15,000. If the dealer is unable to sell the structure he/she will generally have it hauled away and disposed of. In Roseburg, one dealer said that he has had all but two destroyed because he does not want them to sit on his lot, in view of the public.²²

Disposal

If an owner is unable or unwilling to renovate or sell his/her old MMHAT, and secondary use is not an option, he or she may decide to dispose of the structure. This process can be costly, as it often includes disconnection fees, transportation costs, landfill tipping fees that

²⁰ Combs, Kim. Douglas County Assessor's Office Manufactured Structure Tech. Personal Interview. May 2, 2005.

²¹ Ibid.

²² Johnson, Mike. Palm Harbor Homes Roseburg Dealership Associate. Personal Interview. May 27, 2005.

generally range between \$30-\$95/ton, and other inherent costs.²³ One hauler noted that the total cost for transportation alone often runs \$2000-\$4000. In cases where the structure is not roadworthy due to its condition, it is put on the back of a trailer and brought to the landfill. In some cases, the structures are demolished on-site, and their debris is hauled to the landfill by the truckload. This process often includes additional clean-up fees. Kim Combs, of the Douglas County Assessor's office, reports that 350 MMHATs were demolished or deconstructed in Douglas County in 2004, compared to just 150 in 2003. She credits low-interest loans on new manufactured homes and repossessions for fueling this influx.

Under the new laws that went into effect on May 1, 2005, owners are required to submit a demolished manufactured structure form to their county's department of assessment and taxation.²⁴ The county will send an inspector, free of charge, to the site to verify the decommissioning of the home. Only when this has occurred can the owner obtain a trip permit to move the structure. This process will also facilitate the structure's removal from the property tax roles.²⁵ Landfills are not supposed to accept structures without this form. Owners are also required to submit photos of the demolished or deconstructed MMHATs to the Douglas County Assessor's Office.

Most components of a manufactured structure can be disposed of in solid waste landfills. Oregon Administrative Rule 340-093-0040 does however prohibit the disposal of "large metal-jacketed residential, commercial or industrial appliances such as refrigerators, washers, stoves and water heaters." Landfills typically have arrangements, however, for accepting and processing these appliances.

Abandonment and Other Illegal Methods of Disposal

Some owners of MMHATs may choose to avoid fees associated with their disposal by simply abandoning them (often illegally) on their own or another's property. Occasionally, people will even attempt to burn or bury their structure. One of the unfortunate side effects of abandoned MMHATs in Oregon is their use for illicit drug manufacturing, namely for methamphetamines. Also, they are generally eyesores to the public and can be attractive nuisances.

²³ Douglas County, however, is the only county in the state which does not charge tipping fees to dispose material in the landfill.

²⁴ An example of this form from Lane County's Department of Assessment and Taxation is included on the Resource CD accompanying this report.

²⁵ Formerly, the decommissioning paperwork was handled by the DMV, which required owners to submit a "dismantled vehicle" form when they had disposed of their MMHAT. However, since few owners consider their MMHAT "vehicles," only a small percentage of these homes were ever officially "decommissioned." Counties would sometimes only learn of a disposal after property taxes were mailed out and the owner contacted them.

Although some jurisdictions have code provisions that specifically outlaw abandonment, these codes are typically complaint driven and not fully enforced. Some jurisdictions do not even have an abandoned structure code provision to compel owners to take responsibility for their structure. Abandoned MMHATs are very difficult to account for, because the nature of abandonment is such that no one is notified of the act. In a pilot project done in 2002, a few counties in North Carolina undertook studies to count abandoned homes. County officials there said they doubted the reliability of census figures and were confirming and documenting the number of abandoned MMHATs by driving the county roads.²⁶

²⁶ Taylor, Dean. Harnett County, North Carolina Planner. Personal Interview. May 13, 2005.

Chapter 3

Regulatory Framework

Without an identified precedent in Oregon, Heartwood's proposed MMHAT salvage facility will likely undergo close scrutiny by the state and county during the permitting process. CPW sought to understand how the state and county will define the operation in order to determine what regulations may be applied to the facility. CPW consulted Oregon Revised Statutes, Oregon Administrative Rules, and the Douglas County Code for definitions and regulatory guidelines.

State and Local Policies

There are two ways that the facility may be regulated by the state: as a Material Recovery Facility or as a Junkyard/Salvage Yard. Douglas County will likely regulate the facility as a Salvage Yard.

Material Recovery Facility

ORS chapter 459 is the controlling legislation for solid waste management in the state of Oregon and is therefore the starting point for identifying the regulations pertinent to the Heartwood facility. The following definitions from ORS chapter 459 are particularly important to reference in characterizing the Heartwood facility. Some of the definitions below have been edited to highlight how they apply to the Heartwood operation.

- ORS 459.005 (24) defines **solid waste** as, “all useless or discarded putrescible and nonputrescible materials, including but not limited to useless or discarded commercial, industrial, demolition and construction materials, discarded or abandoned vehicles or parts thereof, discarded home and industrial appliances.....” MMHATs obtained by Heartwood will be useless or discarded and thus meet the statutory definition of solid waste.
- ORS 459.005(16) defines **material recovery** as, “any process of obtaining from solid waste, by presegregation or otherwise, materials that still have useful physical or chemical properties and can be reused or recycled for some purpose.” Heartwood's process of salvaging usable and recyclable components of MMHATs meets the statutory definition of material recovery.
- ORS 459.005 (8)(a) defines **disposal site** as “land and facilities used for the disposal, handling or transfer of, or energy recovery, material recovery and recycling from solid wastes....” Since Heartwood will be performing material recovery at a centralized

location, this facility will meet the statutory definition of a disposal site.

The Department of Environmental Quality administrative rules are also instructive with regard to the proposed facility. OAR chapter 340 division 093 lays out the general provisions governing solid waste. OAR 340-093-0030 provides key definitions that are not available in the state revised statutes. The definition of a material recovery facility clarifies the type of “disposal site” that characterizes Heartwood’s proposed facility.

- OAR 340-093-0030(57) defines a **material recovery facility** as, “a solid waste management facility that separates materials for the purposes of recycling from an incoming mixed solid waste stream by using manual and/or mechanical methods, or a facility at which previously separated recyclables are collected.”

The Douglas County Code (DCC) will also exert regulatory authority over Heartwood’s proposed facility if it is sited in unincorporated Douglas County. The DCC adopts the definition of disposal site used in ORS 459.0005 (above).

Junkyard/Salvage Yard

If Heartwood runs the resale part of its business at the deconstruction facility, it may also be regulated as a junkyard. If the deconstructed components of the structures are expediently moved to another place for sale or disposal, the facility may not be considered a junkyard.

- ORS 377.605(6) defines a **junkyard** as, “any establishment or place of business where there is accumulated on the premises eight or more motor vehicles or an equivalent volume of junk that is maintained, operated or used for storing, keeping, buying or selling of junk and the term includes automobile graveyards, garbage dumps and scrap metal processing facilities.”
- ORS 377.605(5) defines **junk** as, “old or scrap copper, brass, rope, rags, batteries, paper, trash, rubber, debris, waste, or junked, dismantled, wrecked, scrapped or ruined motor vehicles, or motor vehicle parts, iron, steel or other old or scrap ferrous, or nonferrous material, metal or nonmetal materials.” The dismantled manufactured homes at the Heartwood facility would seem to meet the definition of junk provided by statute.

The Douglas County Code does not make reference to junkyards. It does, however, speak to **Automobile Wrecking Yards** and **Salvage Yards**. These terms are more inclusive than the statutory definition of junkyard because they explicitly pertain to operations that dismantle and salvage materials. Therefore, whether or not Heartwood keeps salvaged materials on-site, the facility would be subject to the County regulations for automobile wrecking yards and salvage yards. Both

types of facilities are subject to the same development standards, as described in the Facility Siting and Facility Permits sections that follow.

- Section 1.090 of the DCC defines an **automobile wrecking yard** as, “Any area of land used for the storage, wrecking or sale of five or more inoperable motor vehicles, trailers, or farm equipment, or parts thereof, where such vehicles, trailers, equipment or parts are stored in the open and are not being actively restored to operating condition, and *includes any land used for the commercial salvaging of any other goods, articles, or merchandise.*” (emphasis added).
- Section 1.090 of the DCC defines a **salvage yard** as, “Any property where scrap, waste material or other goods, articles or second-hand merchandise are dismantled, sorted, stored, distributed, purchased or sold in the open.”

Facility Siting

How the facility is defined has implications for siting. If it is defined as a material recovery facility, one set of policies apply, if it is defined as a junkyard, then another set applies. If it is defined as an automobile wrecking yard/salvage yard, an additional set of rules apply.

If a Material Recovery Facility...

Material recovery facilities are governed by OAR 340-096-0040 “Transfer Stations and Material Recovery Facilities.”²⁷ OAR 340-096-0040 outlines requirements that will apply to Heartwood’s plans, design and construction, and storage and salvage operations. For instance, this rule specifies that salvaged materials must be stored in an enclosed building. These important regulatory details should be reviewed in full as part of the operation’s establishment. This rule has been included in the Resource CD accompanying this report to for reference.

If a Junkyard....

ORS 377.620 places restrictions on the siting of junkyards that will be relevant to Heartwood if the facility is deemed to be a junkyard. Junkyards cannot be within 1000 feet of the right of way of an interstate or state highway (unless permitted by the Director of Transportation). Junkyards that are visible from the highway must either be screened or located in a zoned industrial area. This is because materials that are kept at a junkyard can be left outside. Junkyards that do not meet these regulations will be declared a public nuisance.²⁸

²⁷ OAR 340-093-0050(2f)

²⁸ Refer to OAR 734-040-0005 to 734-040-0020 for more details on junkyard siting and screening.

If an Automobile Wrecking Yard/Salvage Yard...

The DCC development standards for automobile wrecking yards and salvage yards are similar to the statutory regulations for junkyards. In our opinion, these regulations are the most likely to apply to the Heartwood facility. The DCC conditionally allows these facilities only on land that is zoned M-3 Heavy Industrial.²⁹ Heartwood must site the facility on M-3 land. Section 3.22.150 of the DCC lays out the minimal property development standards that apply to these facilities, and is included on the Resource CD accompanying this report.

Facility Permits

How the facility is defined also has implications for the permitting. In short, the permit requirements are dependent on the type of facility.

If a Material Recovery Facility...

OAR 340-093-0050 requires material recovery facilities to obtain a solid waste disposal permit from the DEQ in order to operate. Permits are typically good for ten years. Heartwood must apply for a permit at least 60 days before operation is scheduled to begin. The DEQ suggests contacting their solid waste department for consultation before beginning the application.³⁰ DEQ staff can help to clarify the application process and conditions of approval for the facility through an initial site evaluation.

Application procedures for a solid waste disposal permit are outlined in detail in OAR 340-093-0070. The DEQ application form for a solid waste disposal permit, as well as an application instruction sheet specifically pertaining to material recovery facilities, are provided in Appendices D and E. As described in detail in both the rule and DEQ instruction sheet, Heartwood will need the following for a complete permit application:

- Land Use Compatibility Statement (LUCS);
- Recommendation from the local solid waste planning authority;
- Certificate of Business Registry;
- List of other known or anticipated permits; and
- Detailed plans and specifications.³¹

The LUCS is a form provided by the DEQ that must be signed by county planning staff after ascertaining that the proposed site for the

²⁹ Douglas County Code 3.22.100

³⁰ DEQ Solid Waste Department Staff in the Western region: 503-378-8240 x252.

³¹ Oregon DEQ "Application for Material Recovery Facility and Transfer Station Permit"
<http://www.deq.state.or.us/wmc/solwaste/permits/permitsmrf.html>

facility is consistent with the county’s comprehensive plan. A copy of the LUCS form is included on the Resource CD accompanying this report.

DEQ assesses solid waste disposal permit application processing fees based on the amount of tonnage that the site handles. It only charges the fee once, at the time of application. Table 2 outlines the fee by weight for a material recovery facility. Once permitted, Heartwood will need to renew its registration on an annual basis. The annual permit compliance fee is also based on tonnage. Table 2 shows the rates for a material recovery facility.

Table 2: Material Recovery Facility Permit Fees³²

Amount of Solid Waste Received per Year	Application Processing Fee	Permit and Registration Compliance Fees
over 50,000 tons	\$500	\$1,000
10,000-50,000 tons	\$200	\$500
less than 10,000 tons	\$100	\$50

Solid waste disposal permits are not required for short-term operations (less than six months) under certain circumstances. Specifically, “if it is determined by the Department (of Environmental Quality) that a proposed or existing disposal site is not likely to create a public nuisance, health hazard, air or water pollution or other environmental problem” the DEQ may issue a letter of authorization.³³ This may be useful for Heartwood’s initial pilot project. Instructions for applying for a letter of authorization from the department are described in OAR 340-093-0060. A summarized application instruction sheet created by the DEQ is available on the Resource CD accompanying this report.³⁴

Regulations pertaining to disposal sites in the DCC would also apply to Heartwood’s proposed facility if it is deemed a material recovery facility. DCC 13.56.131 authorizes the county to require permits for several circumstances, including “...2. Any activities at disposal sites...” Heartwood should contact the Douglas County planning department for information on this permit when other operational details are clarified (e.g. siting of the facility, anticipated solid waste stream, duration of use, etc.).

³² OAR 340-097-0120

³³ OAR 340-093-0050(5)

³⁴ Oregon DEQ “ Letter of Authorization Application”
<http://www.deq.state.or.us/wmc/solwaste/permits/permitsmrf.html>

If a Junkyard

A permit is not needed from the state to operate a junkyard; Douglas County Code does not recognize junkyards.

If an Automobile Wrecking Yard/Salvage Yard...

Automobile wrecking yards and salvage yards in Douglas County require a conditional use permit. As mentioned in the Facility Siting section, these facilities are only conditionally permitted on M-3 land. Heartwood will need to submit an application to the county with its facility plan for a conditional use permit. The decision to grant the conditional use permit will be subject to the County Planning Commission's approval at a public hearing.

Chapter 4

Evaluation of Operational Issues

Along with establishing the facility, Heartwood will need to institute a mechanism for obtaining MMHATs. The data show there are a substantial number of MMHATs in Douglas, Coos, and Curry Counties—enough that the supply of salvaged materials may exceed demand. The structures that have reached the end of their useful life are the obvious candidates for deconstruction and salvage. These structures are typically identified as obsolete either by the MMHAT owner or the local code enforcement officer (who would typically be alerted by a landowner or concerned neighbor). Different opportunities and challenges are present for working with these groups to obtain obsolete MMHATs for deconstruction. One notable opportunity is the potential for charging a fee for the removal of structures that would otherwise be disposed.

Providing an Alternative to Disposal

For Cities and Counties

Partnerships with local cities and counties could provide a mechanism for obtaining obsolete structures. Comparable operations reviewed as part of this study (See Chapter 5) worked in conjunction with local governments to obtain structures that were in violation of local nuisance abatement ordinances. Where similar codes exist locally, Heartwood has an opportunity to work in conjunction with the government to remove the unwanted structures.

In the City of Roseburg, the code provides enforcement mechanisms to deal with derelict and dangerous structures as nuisances. Derelict structures are defined in the Roseburg City Code section 7.04.050 as “any building or structure which is unoccupied and boarded or which is unoccupied and unsecured.” If the code enforcement officer deems a structure derelict, the owner has the option to pay a \$100/month fee for up to one year to maintain the structure in that condition. After the one-year, the owner must have either demolished or repaired the structure.

Roseburg City Code section 7.04.030 also provides a definition of attractive nuisances that includes “D. An open, vacant structure which is attractive, dangerous and accessible to children or which is used for habitation by trespassers.” The city’s code enforcement officer makes the determination of an attractive nuisance based on the outside condition of the property. Once it has been deemed an attractive

nuisance, the property owner must make the structure code compliant by securing it from trespass.³⁵

The Roseburg City Code defines dangerous structures in section 7.04.040. Health officers or building officials can deem a structure dangerous based on its negative impacts to public health, safety, and welfare. This category includes buildings that are no longer structurally sound or that are at significant fire risk. A building that is deemed dangerous must be torn down. If the owner does not address the situation, the City will take action and put a lien against the owner's property in order to recover the cost of demolition and removal. The owner may also face substantial fines of up to \$1,500/day for a total not to exceed \$50,000. These fines are assessed by a court.

Heartwood could establish a relationship with the city, either contractually or informally, that provides Heartwood with MMHATs that have been subject to these abatement codes. In the course of enforcing either the derelict or dangerous structure codes, the city could, at minimum, advertise the services of Heartwood when sending notices regarding abatement of a nuisance. In the event that the city reaches the stage of removing either a derelict or dangerous MMHAT, they could utilize Heartwood's services instead of merely disposing of the structure. The city could pay Heartwood for this service and use the lien on the property to recoup the fee.

Unfortunately, in Douglas County, there is no hazardous building abatement code. The County therefore has no real leverage to compel owners to remove dangerous and/or derelict buildings from the landscape and thus, no reason to directly engage Heartwood's services.³⁶ Other local cities and neighboring counties may have abatement codes like Roseburg though. These local governments are therefore potential clients/partners for Heartwood.

For owners

Heartwood could advertise its deconstruction services to regional MMHAT owners who want to dispose of their obsolete structure. In this scenario, Heartwood would essentially be in the position of competing with the landfill as a disposal site. Comparable operations have successfully charged homeowners for the service of removing unwanted structures. Heartwood will likely find it difficult to follow this model, however, because of the disposal policies in Douglas County, specifically the absence of tipping fees at the landfill.

The presence of a free disposal option obviates any financial incentive for a Douglas County MMHAT owner to pay Heartwood to take their unwanted structure. Heartwood may be able to charge homeowners

³⁵ Larry Caldwell. City of Roseburg Code Enforcement Officer. Personal Interview. 5/24/05.

³⁶ Chris McCullough. Douglas County Code Enforcement Officer. Personal Interview. 5/24/2005.

from other counties because these individuals would not have the option of free disposal. However, the cost of transporting the structure to Heartwood's facility might be so expensive that it cannot compete with the owner's alternative option of paying the cost of disposal at their nearest county landfill. Disposal costs in two neighboring counties are provided in the table below.

Table 3: MMHAT Disposal Fees in Coos & Curry Counties

Landfill	MMHAT Disposal Option	Requirements	Costs
Coos County- <i>One County Landfill</i> 541-396-5444	Coos County landfill accepts MMHATs.	MMHATs must be pre-demolished to dispose at landfill (separate service must be procured).	\$16.50 for first cubic yard of C&D waste plus \$22 for each additional cubic yard
Curry County- <i>No County Landfills</i> Curry Transfer & Recycling, Inc operates transfer stations in county 800-826-9801	Curry Transfer & Recycling, Inc. Brookings office (17498 Carpenterville Rd.) accepts intact MMHATs.	Curry Transfer & Recycling has equipment to demolish MMHATs before transfer to Medford Landfill.	Travel trailers - \$250 (will do pick up for total of \$375) Mobile homes less than 28' - \$375* Single wide manufactured home - \$1900* Double wide manufactured home - \$4000* \$20.95/cubic yard for additional junk in home (*Prices do not include transportation costs to office. Owner must arrange to bring structures to office.)

Financial Issues and Options

It is also possible that Heartwood will be charged for disposal of non-salvageable materials from MMHATs that come from other counties. This would further increase the cost that Heartwood would need to charge out of county owners, possibly impeding Heartwood's ability to offer a rate that is competitive with the owner's local landfill.

It is unlikely that Heartwood will be able to finance the cost of deconstructing a structure by charging the owners because of the disposal policies that are in place in Douglas County. Funding will need to originate from other sources to cover the costs of the operation. However, advertising the service to MMHAT owners could still be used to locate structures if there is funding in place to finance the operation.

Grants

One way that local governments might provide support to Heartwood's operation would be through grants that could subsidize the operation's costs. This could enable Heartwood to compete with the free landfill for the privilege of obtaining owners' unwanted structures. From the county's point of view, the space savings to the landfill would be a significant incentive for supporting a waste reducing service like Heartwood is proposing.

Douglas County may even be persuaded to support the operation of Heartwood's facility out of their commitment to meet the intent of the state mandated Opportunity to Recycle policy³⁷. Under Douglas County Code section 13.44.020, compliance with this mandate includes:

A. Opportunity to Recycle. Provide an opportunity to recycle as part of the overall solid waste collection system taking advantage, where possible, of coordinated area-wide service, promotion, education, and marketing.

B. Encourage research and demonstration projects in recycling, reuse, resource recovery and solid waste management generally by and through franchises with technical assistance of other persons.

Opportunity to Recycle policies typically refer to support for the recycling services offered by waste management franchises. However, the commitment to encourage recycling research and demonstration projects could potentially be leveraged to seek a grant from the county for Heartwood's MMHAT recycling services.

Insurance

Homeowners' insurance policies are another possible source of funding for manufactured homes that have been subject to a natural disaster (e.g. flood). Coverage for "debris removal" can be used to pay for the removal and disposal of a manufactured home, or in this case, their removal, salvage, and disposal. The potential for this funding depends, however, on the coverage that is given specifically for debris removal, which varies depending on the policy.

Resale Markets

Some return on the cost of MMHAT deconstruction can be recouped through resale of reusable and recyclable materials salvaged from the structures. This return will probably not be sufficient to fully finance the operation, but it could be an important component of a more complex financing strategy. More essentially, it is an integral aspect of the overall mission to divert reusable goods from the landfill. The value of salvaged parts depends on the type and condition of the MMHAT as

³⁷ For background see 1991 Senate Bill 66 and 2001 House Bill 3744 or refer to the DEQ Fact Sheet included in the Resource CD accompanying this report.

well as the prevailing resale markets. Markets locally available to Heartwood are discussed in the Resale Markets Available to Heartwood section below.

Transporting MMHATs

The success of Heartwood's proposed MMHAT centralized salvage facility will depend on the ability to bring structures to the site for processing. CPW explored the state regulations that apply to the transportation of MMHATs. The regulations relating to transportation are particularly important to understand because MMHAT ownership and taxation record keeping are also verified through the transportation regulatory procedures.

Although private contractors could be hired for the transportation of MMHATs to the facility, Heartwood may want to consider offering a service that includes transportation. The conventional option for homeowners who want to get rid of their MMHAT is to hire a company that will remove and transport a structure to the landfill. The fees commanded for this service can be quite extensive. Offering the same removal service in conjunction with the deconstruction and salvage service would position Heartwood to compete more effectively with existing disposal options.

Authorized Transporters

Prior to May 1, 2005, manufactured homes were considered vehicles and regulated as such by the Department of Motor Vehicles. On May 1st, an amendment to ORS 801.590 went into effect to state that the statutory definition of "vehicle" no longer includes manufactured homes. This distinction, along with a coordinated set of amendments, changes the manner by which manufactured structures can be moved in the State of Oregon.

Although no longer considered a vehicle, moving a manufactured structure can only be done by a business with a vehicle transporter certificate. It is a class D traffic violation to tow a manufactured structure if you do not have a vehicle transporter certificate.³⁸ Heartwood can either seek to obtain a certificate, along with the appropriate vehicle,³⁹ or engage a licensed business for this purpose. Vehicle transporter certificates are valid for one year and cost \$150. The application form is included on the Resource CD accompanying this report.

³⁸ ORS 822.300

³⁹ OAR 734 Division 73, 74 and 82 rules govern vehicles and loads that exceed statutory maximum size and weight limits; conditions that would apply to a vehicle moving a manufactured structure.

Trip Permits

To move a structure to its facility, Heartwood must also obtain a trip permit.⁴⁰ Trips permits cost \$5 for each MMHAT and are valid for 30 days. Trip permits are issued by the Department of Consumer and Business Services and can be obtained through a licensed transporter or through the county assessor's office. They can also be printed directly from the LOIS Manufactured Housing online system for registered users.

The LOIS system has been created as part of the transfer of authority over manufactured structures from the DMV to the DCBS Building Codes Division. As described by the Building Codes Division, LOIS is specifically designed to:

- Maintain siting and ownership information for manufactured structures sited in Oregon;
- Generate official documents including the Ownership Document and Trip Permit;
- Provide real-time access to data for update and output;
- Limit access to authorized users and customize functionality based upon the specific user group; and
- Allow sophisticated data reporting tools.⁴¹

LOIS can be used to a limited extent by the public, but registered system users can access the full functionality of the program. It is designed for dealers, transporters, lenders, and counties. There is no charge for being a registered user.⁴²

Trip permits are essentially a mechanism by which the DCBS tracks ownership of manufactured structures and ensures that taxes are satisfied. In order to obtain the permit, you must provide the DCBS with the following information:

- Ownership document/ DMV title or property description if the structure is registered in the deed records of the county;
- Location that the structure is being moved to; and

⁴⁰ Trip permits are only not required in the case of transport between manufacturer and dealer.

⁴¹ Building Codes Division: Manufactured Home Ownership
<http://www.bcd.oregon.gov/lois/faq.html>

⁴² To become a registered system user contact Sherry Mitchell, MFD Ownership Program Specialist (Sherry.D.Mitchell@state.or.us or 503-373-1309) or submit the system user form included on the Resource CD accompanying this report.

- Identity of future owner/facility (e.g. Heartwood).⁴³

If there are outstanding back taxes on a structure, the DCBS will not issue a trip permit. There is a loophole, however, in the event that the structure is abandoned. This exception is codified in ORS 90.425 and 90.675, which provide landlord remedies when a tenant abandons personal property. For example, if a structure is abandoned in a mobile home park, the park owner could use this provision to get the home removed. If the tax-assessed value of the structure is \$8,000 or less, a Certification of Possessory Lien Foreclosure can be obtained by the landlord in order to dispose of the structure or give it to a nonprofit organization.⁴⁴

Deconstruction Methods

Once MMHATs are moved to Heartwood's centralized facility, deconstruction and salvage can begin. Deconstruction methods for MMHATs vary widely, from intensive manual labor to sophisticated mechanization. These methods can be combined in almost limitless ways, but specific operational needs and goals can help determine the best procedures to use. For instance, different deconstruction methods produce varying yields in terms of salvaged and recyclable materials. Operations concerned with environmental impacts may want to choose methods that have the highest landfill diversion rates. However, the availability of local resale markets can be the ultimate limiting factor in this regard. The roadworthiness of MMHATs is another consideration. Some MMHATs are no longer fit for travel and would require onsite deconstruction procedures. The following section reviews some of the main methods employed and their strengths and weaknesses.

Manual Methods

Manual deconstruction methods are often time consuming, taking between 2 to 5 days to deconstruct a single MMHAT, but they can result in higher landfill diversion rates. Manual techniques allow structures to be carefully taken apart one piece at a time, preserving many breakable components and materials, such as lumber, windows, and fixtures. One of the greatest increases in salvageable materials is reusable lumber. However, removing lumber intact is time intensive and requires thorough nail removal for resale. While this is not economically feasible for smaller dimensions of lumber, larger pieces do have higher resale potential. Despite the high diversion rates possible with manual methods, the increased materials are less valuable than the metals recovered from mechanical methods alone. For this reason, sole reliance on manual labor may not be the best method.

⁴³ ORS 446.631

⁴⁴ A copy of the application for a Certification of Possessory Lien Foreclosure is included on the Resource CD accompanying this report.

Mechanized Methods

Mechanical deconstruction methods rely on various types of machinery, such as industrial shredders, grinders, and excavators. Start-up costs are high for mechanized processes since machinery is expensive. But if large volumes of MMHATs are processed, these costs can be easily justified. Mechanized deconstruction methods can be extremely time efficient. Operations that would require hours to do manually can be done in a matter of minutes.

Mechanized methods, however, can also reduce the quantity of salvageable goods. Machinery cannot remove fragile components, like windows, or small components, like light fixtures. Processes like shredding eliminate the salvage-ability of lumber, although, there are still uses for shredded wood.

Although mechanized methods cannot replace manual labor in thoroughness of reclaiming all potential salvageable components, mechanized methods can still achieve high landfill diversion rates. Additionally, due to the extreme efficiency possible, mechanized deconstruction may be a good choice in locations where the resale markets are not strong enough to justify salvaging more components. Mechanical deconstruction methods are most effective and efficient at salvaging metals from MMHATs.

Excavator

Although it may seem large and clumsy, a skilled worker can salvage many pieces from a MMHAT very quickly with an excavator.⁴⁵ In Brunswick County, North Carolina, the Solid Waste Department utilizes an excavator in MMHAT deconstruction at their Construction and Demolition Landfill. A tractor or track loader pulls the MMHAT to the edge of the working face of the landfill. Then, an excavator lifts up on the bottom edge of the structure and flips it onto its side. Once in this position, the sheer weight of the axel and frame will cause them to pull away from the rest of the structure. The tractor or track loader can then pull the axel and frame aside for recycling. Next, the excavator uses its bucket to crush in the roof of the MMHAT, allowing access to the interior. The excavator can then remove metal fixtures and white goods, which it places into a dump truck for recycling. The rest of the structure is then demolished and pushed into the landfill. The whole process takes only about 30 minutes and yields diversion rates of approximately 30%. The in-house costs are \$65 per MMHAT.⁴⁶

⁴⁵ Surwilo, James. Solid Waste Management Program, Vermont Department of Environmental Conservation. Personal Interview. 4/2005

⁴⁶ Rumley, Stephanie. Brunswick County Solid Waste and Recycling. *Mobile Home Recycling* Powerpoint presentation. CRA 13th Annual Conference. March 18-21, 2003.

Industrial Shredders and Tub Grinders

Shredding and grinding are mechanized deconstruction methods, which are oriented to the recycling rather than salvage industry. These methods can quickly reduce the size of MMHATs. While some large pieces of metal can be put aside without shredding, most materials are taken off an MMHAT using an excavator and placed in the shredder or grinder as the structure is deconstructed. The shredded materials are then sorted using mechanical means or manual laborers, often with the aid of a conveyor belt. In some cases, both mechanical and hand labor are used to sort the materials. Metals are the primary materials reclaimed from this process. High diversion rates are possible if markets are available for the other materials. The speed of this method can make it attractive. Zanker Materials Processing Facility in San Jose, California can process four to five MMHATs in one day using this method.

Companies like Morbark and Vermeer have developed mobile shredders that can be towed from site to site to shred MMHATs that are not transportable.⁴⁷ Shredded materials are then hauled off site for sorting. Care must be taken when using mechanized methods for onsite deconstruction. Safe distances must be maintained from other homes, trees, and especially power lines. Many mobile home parks have small lot sizes and can be a challenge for safe, mechanized deconstruction methods.

Reusable and Recyclable Components

The diversion rate that Heartwood's MMHAT deconstruction and salvage operation can achieve will depend not only on the methods employed, but most essentially, on the actual amount of reusable and recyclable content in an MMHAT. Currently, not all MMHAT components are worth salvaging, either because materials are too deteriorated for reuse or because prevailing markets and technology do not support recycling of the material.

MMHATs that are being decommissioned are frequently uninhabitable and may suffer from mistreatment, deferred maintenance, or water or other forms of damage. For instance, rugs may be stained, and floors and walls may have holes in them. Other materials, such as insulation, vapor barriers, tarpaper, and ceiling tiles are not easily reused or recycled no matter the quality of their condition. Therefore, they have little resale value and usually end up in the landfill.

Materials that are salvageable include metals, wood, gypsum, appliances, and fixtures. Although the salvageable content of an MMHAT will vary by its type and condition, Heartwood can expect to see trends in the quantity and value of the materials to be salvaged.

⁴⁷ The Resource CD includes information about Morbark's Predator, a high torque, portable shredder designed to process C & D debris.

Metals tend to be the most valuable materials as they resist deterioration and can still be recycled. Appliances and reusable parts such as doors and windows can be valuable reusable items. Lumber can also be fairly valuable for reuse or recycling, depending on its quality.

Metals

Metals can account for approximately 3,000 pounds of a mobile home.⁴⁸ The three main types of metals, which make up the most weight, are aluminum, light gauge steel and heavy gauge steel. The aluminum comes largely from the siding and roof. A MMHAT recycling feasibility study undertaken in Vermont reclaimed an average of 525 pounds of aluminum per home, while a pilot project done by Rockingham County, North Carolina averaged around 708 pounds per home.⁴⁹ The framework of metal underneath the floor is the largest component of the heavy gauge steel. This source alone weighs between 1200 to 1500 pounds depending on the structure's length.⁵⁰ Wiring represents a significant amount of weight at around 50 pounds. Copper will add up to around 14 pounds. Brass and galvanized steel are also likely to be present but in very small quantities.⁵¹

Wood

The most valuable wood to salvage from MMHATs is the larger pieces of lumber found in floor joists (2" x 6"), wall studs (2" x 4"), and the roof. All the nails and staples must be removed for resale.⁵² Because this process requires manual labor, it is only economically feasible to salvage high quality lumber. MMHATs that were manufactured prior to 1985 typically have 2" x 2" or 2" x 3" lumber in the walls,⁵³ and rather than gypsum board, very thin plywood paneling was used for further cost savings.⁵⁴ These cheaper wood materials have little resale value.

⁴⁸ Vermont Agency of Natural Resources; Town of Bristol, Vermont; and Manufactured Housing Institute. *A Feasibility Study of Mobile Home Recycling*. 2000. And,

Rockingham County Environmental and Engineering Services. *Mobile Home Recycling Pilot Project Analysis*. Rockingham County, 2002.

⁴⁹ Ibid.

⁵⁰ Rumley, Stephanie. Brunswick County Solid Waste and Recycling. *Mobile Home Recycling* Powerpoint presentation. CRA 13th Annual Conference. March 18-21, 2003.

⁵¹ Rockingham County Environmental and Engineering Services. *Mobile Home Recycling Pilot Project Analysis*. Rockingham County, 2002.

⁵² Surwilo, James. Solid Waste Management Program, Vermont Department of Environmental Conservation. Personal Interview. 4/2005

⁵³ Richards, Curtis. Palm Harbor Homes, Marketing and Sales Director. Personal Interview. 5/17/2005.

⁵⁴ The Center for Auto Safety. *Mobile Homes: The Low-Cost Housing Hoax*. Grossman Publishers, New York. 1975

Much of the wood in older MMHATs is also not economically feasible to salvage due to a variety of factors including rotting and damage incurred during the deconstruction process. Wood that cannot be reused as-is can be shredded for use as mulch or biofuel. Salvageable, clean lumber can make up a large part of MMHATs. The Vermont MMHAT recycling feasibility study averaged 511 pounds of lumber per structures⁵⁵ and the Rockingham County, North Carolina pilot project averaged 435 pounds per structure.⁵⁶

Gypsum

Gypsum board (e.g., drywall, wallboard, sheetrock, plasterboard) is found in structures manufactured after 1985. Approximately 90% of gypsum board is the actual gypsum (a naturally occurring mineral) and 10% is paper backing and facing. Gypsum board has been successfully recycled for the following uses:

- Manufacture of new drywall
- Use in cement production
- As a soil amendment or plant nutrient
- In the manufacture of fertilizer
- An amendment to composting systems
- Animal bedding⁵⁷

To recycle gypsum board, the paper needs to be removed and the size of the gypsum needs to be reduced. This can be accomplished with a standard tub grinder and a screen. Dust is a common problem in this process and permits related to air pollution may be required. Containing the process or sprinkling the gypsum with water can mediate the dust problem.

New West Gypsum Recycling (NWGR)⁵⁸, headquartered in British Columbia is one company that manufactures a portable drywall/gypsum recycling system. Their Gypsum Waste Recycling Unit can process dry and wet waste gypsum at an average of 25 tons per hour. The process separates the paper and removes all impurities from the gypsum, making it ready for recycling.

Other Components

There are a variety of other salvageable components in MMHATs, such

⁵⁵ Vermont Agency of Natural Resources; Town of Bristol, Vermont; and Manufactured Housing Institute. *A Feasibility Study of Mobile Home Recycling*. 2000.

⁵⁶ Rockingham County Environmental and Engineering Services. *Mobile Home Recycling Pilot Project Analysis*. Rockingham County, 2002.

⁵⁷ <http://www.drywallrecycling.org> EPA funded website provides an excellent discussion of the processing involved for recycling for different markets.

⁵⁸ North West Gypsum Recycling website: <http://www.nwgypsum.com/index.htm> Contact: info@nwgypsum.com (604) 534-9925

as white goods, windows, doors, fixtures, furnaces, and breaker boxes. These represent some of the most easily salvageable items and they can also be the most valuable components. The components are removed manually, making them more labor intensive, but their value typically justifies the effort. Some items, like doors, are usually size specific to MMHATs and will have value mainly as replacement parts for MMHATs that are still in use. Sinks and bathtubs are not as valuable as some other components but are fairly easily salvaged, making them worthwhile to remove.

Hazardous Materials

Deconstruction of MMHATs will invariably involve handling some hazardous materials.⁵⁹ These materials may include mercury, americium, and lead. The following section provides information on these materials and suggestions for Heartwood on how these materials should be handled based on best practices and applicable regulations.

Mercury

Mercury is a toxic metal that is found in thermostats. All mercury containing thermostats must be labeled in accordance with OAR 340-090-0510. The labels must read, "Contains Mercury. Manage Properly," which makes it easy for Heartwood to identify them. Mercury containing thermostats should not go to the Douglas County landfill. They can be recycled, and a nonprofit branch of the National Electrical Manufacturers Association, the Thermostat Recycling Corporation, offers this service.⁶⁰

Mercury containing thermostats are regulated as a "universal waste."⁶¹ Universal wastes are subject to a special set of disposal regulations designed to encourage proper waste management. Heartwood should not be subject to the requirements of being a universal waste handler however, unless it "receives universal waste from other universal waste handlers and accumulates the universal waste for more than 10 days prior to shipment off-site."⁶² In the unlikely event that these conditions are met, Heartwood should consult the DEQ's rules pertaining to small quantity universal waste handlers.

Americium

Americium is a radioactive metal. The isotope americium-241 is commonly used in smoke detectors. Exposure to radiation increases the

⁵⁹ For the purposes of this report, "hazardous materials" implies a potentially dangerous material, not a hazardous material as defined by the federal government.

⁶⁰ Thermostat Recycling Corporation <http://www.nema.org/gov/ehs/trc/> 1-800-238-8192

⁶¹ Universal wastes are listed in 40 CFR 273.1 and OAR 340-113-0010.

⁶² Oregon DEQ. "Fact Sheet: Universal Waste Handler" <http://www.deq.state.or.us/wmc/hw/fsuwh.html>

likelihood of cancer. Exposure to a significant amount of americium is unlikely. However, to avoid low-level radiation exposure, workers should not dismantle smoke detectors found in MMHATs. Workers should separate smoke detectors that are removed from MMHATs from other salvage and waste material piles to ensure that they are not inadvertently crushed. Heartwood may want to explore alternatives to sending smoke detectors to the Douglas County landfill. Disposal of smoke detectors at the landfill is permitted, however.

Lead

Lead is most likely to be found in the form of lead-based paint applied to trim or siding before the 1978 ban on its application. Lead exposure is associated with damage to the central nervous system. The federal Resource Conservation and Recovery Act requires generators of demolition wastes to test items for lead-based paint. The standard test involves a Toxicity Characteristic Leaching Procedure. This standardized testing requirement would presumably extend to deconstruction operations as well. However, the Oregon DEQ's policy is not to require demolition operators to perform this test as long as they have removed other evident hazards from the building (e.g. lead piping, mercury containing thermostats) and disposed of the suspected hazardous waste in a permitted solid waste landfill.⁶³

Asbestos

The potential threat of asbestos containing materials (ACM) in MMHATs has been a significant roadblock for some salvage operators. The following section provides information on what asbestos is, how it can be located, and what options exist for dealing with it.

Asbestos is a fibrous silicate mineral and a known carcinogen. When disturbed, its fibers may become airborne causing a respiratory hazard. Asbestos has been linked to fatal diseases including asbestosis (a lung disease), mesothelioma (a cancer of the pleura), and lung cancer. The harmful effects of asbestos have been known to go unnoticed for as long as 15-40 years.⁶⁴ Asbestos was once widely used in building materials due to its qualities of strength, insulation, and chemical and thermal stability. It has been used in tiles, shingles, siding, insulation, wallboard, adhesives, and other common products.

In 1989, the EPA tried to curtail asbestos use through the Asbestos Ban and Phaseout Rule⁶⁵. The EPA succeeded in banning any new applications of asbestos as well as a few applications that were then in use (i.e. corrugated paper, rollboard, commercial paper, specialty paper,

⁶³ Oregon DEQ. "Management of Building Demolition Waste Policy Interpretation 1997-PO-002A"

⁶⁴ US EPA. "What is Asbestos"

⁶⁵ 40 CFR 763, Sec. 762.160 - 763.179

and flooring felt). In 1991, however, much of the rule was vacated and remanded by the U.S. Fifth Circuit Court of Appeals. Asbestos is still in use today in applications such as roof shingles, but use has declined substantially. According to the National Cancer Institute, “Domestic consumption of asbestos amounted to about 719,000 metric tons in 1973, but it had dropped to about 9,000 metric tons by 2002.”⁶⁶ Contact with asbestos is now strictly regulated by both federal and state agencies.

Predicting whether a building has ACM is difficult, if not impossible, to do. Some agencies use a benchmark in time to assess whether ACM is likely. For instance, Oregon Occupational Safety and Health Division (OR-OSHA) rules define building materials that were installed before 1981 as “presumed asbestos containing materials” (PACM), while DEQ rules use 1987 as the installation date before which materials are PACM. Since building materials can be reused though, these dates should not be considered an assurance of safety. The only way to truly determine the presence of ACM is to test the suspect materials in a laboratory.

Testing for Asbestos

The DEQ requires that an accredited inspector perform an asbestos survey before demolition or renovation of a building. The inspector takes samples of suspect materials and sends them to a laboratory for testing. Companies that perform asbestos inspections assess their fees based on how many samples are taken (which depends on the quantity of materials present in the building) and how many hours it takes to perform the service. Costs for two Eugene companies are provided below:

Table 4: Asbestos Testing Costs for Two Local Companies

Company	Hourly rate	Additional Cost for testing samples
PBS Environmental ⁶⁷	\$65/hour	\$20/sample
ECS/Wagner Environmental ⁶⁸	\$40/hour	\$25-\$30/sample

PBS Environmental, which claims that it does very thorough inspections and thus takes more samples than other companies, said that 10-15 samples is typical for a single-family residential home,

⁶⁶ National Cancer Institute. “Asbestos Exposure: Questions and Answers” website: http://cis.nci.nih.gov/fact/3_21.htm

⁶⁷ PBS Environmental Eugene office phone number: 541-686-8684

⁶⁸ ECS/Wagner Environmental phone number: 1-800-879-9061

bringing the total cost for a survey to approximately \$500-\$700 (e.g., 15 samples x \$20 + 4.5hrs x \$65).

Heartwood may also want to train someone in-house to perform the inspection. PBS Environmental's Portland office offers a 3-day training course for accrediting inspectors at a cost of \$425.⁶⁹ It also offers custom trainings at customers' facilities. An in-house inspector would need to utilize a laboratory to conduct the tests on whatever samples are taken. There are a few analytical laboratories within an hour of Roseburg. Prices are in the range of \$20-\$25 per sample for bulk orders.

If the survey reports that there is no ACM in the building, then the deconstruction process can begin. The person responsible for the operation should keep the survey results on the premises throughout the process for verification by DEQ officials; results do not need to be independently submitted to the state. If the survey reports the presence of ACM in the building, it will specify which samples contained the asbestos. The DEQ requires that all ACM be removed from a building before any work is done that might disturb and release asbestos fibers.

When ACM is Present

Heartwood will need to decide how to proceed when test results are positive for the presence of ACM. Two different state agencies have regulations that pertain to the removal of ACM. The DEQ is responsible for protecting the public's health and the Oregon Occupational Safety and Health Division is responsible for protecting worker's health. The Douglas County landfill is an approved disposal site for asbestos waste, should Heartwood choose to handle ACM. However, the requirements and liability surrounding ACM removal may prove to be cost prohibitive. There are essentially three options to choose from if Heartwood encounters structures with ACM.

Option #1: Heartwood chooses not to salvage buildings with ACM. In an outreach piece designed to educate manufactured home dealers and contractors about asbestos, the DEQ warns, "If you disturb or mishandle ACM and cause employees, customers, tenants, the public or the environment to be potentially exposed to asbestos fibers, you can be liable for clean-up costs and an enforcement action for rule violations. An enforcement action may include a civil penalty assessment."⁷⁰ It may be easier to stay clear of this operation altogether.

Option #2: Heartwood chooses to salvage only buildings with nonfriable ACM. Nonfriable ACM is material that cannot be crushed

⁶⁹ See the Resource CD for the DEQ's list of accredited training providers and their contact information.

⁷⁰ Oregon DEQ. "Fact Sheet: Asbestos Advisory & Informational Outreach for Manufactured Home Dealers and Contractors"

by hand and if the ACM is not damaged or badly weathered, it will not easily release asbestos fibers. Examples of nonfriable ACM could include vinyl floor tile, AC water pipes, and cement siding or roofing.⁷¹ A person does not need to be a licensed asbestos worker to perform nonfriable asbestos abatement in her own home, which reflects the fact that it can be done safely if basic precautions are taken. However, strict OR-OSHA and DEQ rules regarding appropriate supervision, training, and operation do apply to those who, like Heartwood, are in the construction industry (see Option #3).

Option #3: Heartwood chooses to salvage buildings with both nonfriable and friable ACM. Friable ACM is material that will more readily release fibers into the air because it can be crushed by hand. Examples of friable ACM could include insulation on piping, ducts and boilers, fireproofing, sheet vinyl flooring, ceiling texture or panel products and soundproofing. Only certified asbestos workers can perform friable asbestos work, which must occur according to the regulations of DEQ and OR-OSHA.

Although a survey can confirm the presence of ACM, a contracted inspector will not tell a client what is friable and what is nonfriable. There is no standard definition of which building materials are friable and which are nonfriable and the condition of the material can be the key to this determination. Ultimately, the person responsible for the deconstruction operation is on his/her own in making this judgment call.

Nonfriable ACM Abatement

Deconstruction involving nonfriable ACM falls under Class II OR-OSHA regulations for asbestos construction work. Nonfriable asbestos abatement is more heavily regulated by OR-OSHA than by the DEQ.

Supervisor Training

OR-OSHA requires that a “competent person” must oversee all nonfriable Class II asbestos work. A competent person is defined as, “one who can identify existing asbestos hazards in the workplace and who has the authority to correct these hazards.”⁷² The DEQ training requirements for a licensed supervisor are equivalent to becoming a competent person (and are the standard referred to in the industry).

Workplace Resources, Inc.’s Asbestos Training Project offers a five-day course in Portland for DEQ supervisor licensure. The cost of this course is \$525, and the DEQ license fee is an additional \$65. To retain licensure, an annual one-day refresher course is required for supervisors. Workplace Resources Inc. offers this course for \$100 plus a \$65 fee for license renewal. PBS Environmental also offers the refresher course at a cost of \$95 plus a \$65 fee for license renewal

⁷¹ Ibid.

⁷² Ibid.

through their Portland office. The contact information for training providers listed on the DEQ website is also included on the Resource CD accompanying this report.

Worker Training

Workers that deal with Class II materials must have training that is hands on and lasts at least eight hours. OAR 437-003-1926.1101(k)(9)(viii) describes what must be incorporated into this training. The purpose of the training is to teach workers how to operate safely by keeping materials nonfriable. A competent person can provide this training as long as it includes the elements described in the OAR. Therefore, if Heartwood invests in training one person to the level of a licensed supervisor, s/he could train other employees to the level necessary for non-friable ACM abatement. Alternatively, private companies offer one-day training courses. There is no licensure associated with the training either way. Workplace Resources, Inc. offers their one-day training course for \$100.

Proper training is only one aspect of asbestos work covered by OR-OSHA and the DEQ rules. There are also extensive rules pertaining to air quality monitoring, job site standards, medical surveillance, protective equipment, work practices, and proper disposal. Some of the requirements are contingent upon the results of the air quality monitoring; others are contingent upon the quantity of asbestos being handled. Most of the rules are conveniently combined in a publication entitled, *Asbestos-Rules of Abatement*, which is included on the Resource CD accompanying this report.

DEQ Notification

The DEQ requires the abatement supervisor to file a notification (form ASN-6) five days prior to beginning nonfriable asbestos work along with a fee of \$35. Notice is typically filed for removal at each new job site. Since Heartwood's operation will occur at a dedicated facility, it may be able to file annual notification, using form ASN-7, instead of filing notification for each MMHAT that is abated. The fee for annual notification is \$350. Annual notification also requires the supervisor to submit a quarterly report (form ASN-3)⁷³.

Friable ACM Abatement

Friable ACM falls under OR-OSHA Class I abatement. Since this material is more hazardous, both OR-OSHA and the DEQ apply stringent safety measures.

Supervisor/Worker Training

As with nonfriable asbestos work, OR-OSHA requires that a "competent person" supervise Class I work. (See previous section for descriptions of DEQ approved courses for supervisor licensure.) Unlike

⁷³ See the Resource CD for DEQ forms ASN-6, ASN-7, and ASN-3

nonfriable work however, OR-OSHA requires that all workers be licensed Oregon asbestos workers. The DEQ requires that the training be provided by DEQ approved companies. One such company, Workplace Resources Inc, offers a four-day worker training course at a cost of \$405/person plus a \$45 licensing fee. Workplace Resources, Inc. offers training in Portland, but they will also make arrangements for providing on-site training for groups of more than six people. The DEQ requires that Oregon asbestos workers take an annual refresher course. Workplace Resources, Inc. offers this one-day course for \$105 plus the \$45 licensing fee.

Some of the most extensive Class I rules for handling asbestos apply only if a certain amount of material is handled or if air monitoring finds that permissible exposure limits are exceeded. Many additional requirements are standard for this type of work. For instance, the employer must provide respirators to the workers and enforce their use. The DEQ/DCBS publication, *Asbestos-Rules of Abatement*, should be consulted for more information on the applicable rules.

DEQ Notification

The DEQ requires the abatement supervisor to file a notification (form ASN-1) ten days prior to beginning asbestos work. The DEQ also assesses a fee for each friable asbestos project; the amount is dependent on the scale of the job. Since Heartwood's abatement will take place at a dedicated facility, it may be able to do annual notification using form ASN-2.⁷⁴ The abatement must be limited to 40 linear or 80 ft² or less in order to qualify for annual notification. The annual notification fee is \$260. Quarterly reports must be submitted if Heartwood pursues the annual notification option (form ASN-3).

Resale Markets Accessible to Heartwood

The final step in Heartwood's process of deconstructing MMHATs will be to sell the salvaged components that have value as reusable or recyclable materials. Since Heartwood is already engaged in the successful resale of reusable building materials, their established markets will be a natural choice for resale of MMHAT components. To the extent that MMHAT salvage will yield unique components however, such as a large quantity of metal, some new markets may be worth exploring.

Metals

Although metals are the most valuable materials recovered from deconstruction of MMHATs, the metals market is volatile, and prices fluctuate. Non-ferrous metals are far more valuable than steel but represent smaller overall quantities. McGovern Metals and the Steel Outlet are two facilities in Roseburg that buy scrap metal. Marshfield

⁷⁴ See the Resource CD for DEQ forms ASN-1 and ASN-2

Bargain House⁷⁵ in Coos Bay, also buys scrap metal, but its prices are currently not as competitive as the Roseburg companies. Schnitzer Steel in Eugene currently pays higher prices for some metals, but the increased transportation costs may reduce the attractiveness of this option. Aluminum may be present in large enough quantities to justify a longer trip.

Table 5: Local Metal Markets

	McGovern Metals (5/24/2005)	Steel Outlet (5/24/2005)	Schnitzer Steel (6/6/2005)
Contact information	3801 Old Highway 99S Roseburg, OR 97470 (541) 679-7012	134 Quarry Road Roseburg, OR 97470 (541) 672-5055 http://www.thesteeloutlet.com	111 Highway 99 North Eugene, OR 97402 541-686-0515 http://www.schnitzersteel.com/index.asp
Steel- clean (\$ per ton)	70-75	70	50
Steel-appliances (\$ per ton)	10	15	N/A
Copper (\$ per pound)	0.95 to 1.10	0.94 to 1.04	0.50 to 1.25
Aluminum (\$ per pound)	0.35 to 0.40	0.33 to 0.40	0.35 to 0.50
Brass (\$ per pound)	0.60 to 0.70	0.50 to 0.60	0.70 to 0.80

Wood

MMHAT deconstruction will yield lumber, which could be sold at Heartwood ReSources existing retail store. The store commonly stocks 2" x 6" salvaged lumber. MMHAT deconstruction may also recover 2" x 4"s of high enough quality to resell. If Heartwood chooses to utilize a grinder, smaller pieces of lumber could be ground and resold as mulch or biofuel. This could be an additional option for revenue generation for Heartwood, as there are emerging markets for biofuel in Central Oregon. Biomass One,⁷⁶ in White City, is a company in Southern Oregon that currently charges for accepting clean wood waste (including C&D lumber and particle board). They grind the wood and resell it for landscaping and biofuel. If Heartwood chooses to pursue this opportunity, Biomass One may be an illustrative example to reference.

⁷⁵ Marshfield Bargain House. 790 North Bayshore Drive Coos Bay, OR 97420. 541-269-1700

⁷⁶ Biomass One Ltd. 2350 Avenue G White City, OR 97503 – 1012 (541) 826-9422

Gypsum

CPW has not located a gypsum recycler in close proximity to Heartwood. In any case, a gypsum recycler would not pay Heartwood for scrap gypsum as there is an abundance of this material. However, if Heartwood chooses to invest in the grinding and screening equipment necessary for processing the gypsum board in-house the material may be recycled and sold for a number of uses. More research is needed to determine the profitability of such an endeavor.

Local farmers could be potential purchasers of gypsum for use as a soil amendment. Companies in the Portland area could be potential purchasers of gypsum for use in manufacturing cement.

Table 6: Cement Manufacturing Companies in Oregon

Ash Grove Cement West, Inc 6720 SW Macadam Ave, Ste 300 Portland OR 97219-2312 503-293-2333 503-293-8999 FAX www.ashgrove.com	Basalite Concrete Products 1740 NE Lombard Pl P.O. Box 11207 Portland OR 97211 503-285-4557 503-285-9179 FAX http://www.basalite.com/default.jsp	Sakrete of Pacific Northwest 1402 N River St Portland OR 97227 503-282-2299 800-245-3833 503-282-2816 FAX www.sakretenw.com
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Components

Heartwood ReSources' retail store is the best location to sell cabinets, white goods, sinks, toilets, bathtubs, windows, doors, fixtures, breaker boxes, and furnaces recovered from MMHAT deconstruction. Some of these items are uniquely sized for MMHATs and could prove a valuable market niche for Heartwood to provide to MMHAT owners and dealers interested in repairs and renovations.

Chapter 5

Case Studies

To inform Heartwood's feasibility study for a MMHAT deconstruction and salvage operation with real world experience, CPW conducted a nationwide search for examples of programs and businesses engaged in this type of work. The examples are intended to provide Heartwood with a variety of models from which to draw inspiration. CPW conducted an extensive literature review and contacted representatives from the manufactured housing industry, recycling associations, and deconstruction contractors to identify potential case studies. CPW identified approximately twenty potential case studies and eight were recommended to Heartwood for further study. Heartwood selected six case studies to pursue and five of those selected agreed to participate in the study:

- The Tomorrow's Home Foundation (Wisconsin);
- Keep Liberty County Beautiful (Georgia);
- The Salvage King (North Carolina);
- CMH Mobile Homes (Michigan); and
- Zanker Materials Processing Facility (California).

Research for each case study involved phone interviews with the organizations' owners and managers. CPW also interviewed state and local officials and landfill operators. Supporting documents were also procured, where appropriate, to elaborate on particularly unique aspects of certain case studies.

Organization

This chapter presents the findings from the five case studies. Each case study is presented individually, in the order listed above. A comparison of the five case studies is presented in tabular form following the individual studies. Finally, a listing of the key considerations in establishing a deconstruction and salvage operation is presented. The key considerations reflect the dominant lesson gleaned from the case studies: there are many options for how to pursue the reuse and recycling of MMHATs. The best practices for any given deconstruction and salvage operation depend on a constellation of factors that need to be considered for each individual operation. Specific recommendations for a Heartwood program are included in the final section of this report.

Tomorrow's Home Foundation

Madison, Wisconsin

Contact Information

Tomorrow's Home Foundation
Amy Bliss
Executive Director

202 State Street, Suite 200
Madison, WI 53703

Phone: 608-255-1088

E-mail: amy@

tomorrowshomefoundation.org

Website:

www.tomorrowshomefoundation.org

Randy Bollig
Samuel's Recycling

4400 Sycamore Avenue
Madison WI 53714

Phone: 608-241-1571

E-mail: rbollig@samuelsrec.com

Website: www.samuelsrec.com

Darryl Craig
Adams County area contractor

Phone: 608-547-6270 Cell
608-339-9294 Home

Bill Dolan
Central to Southern Wisconsin area contractor

Phone: 608-935-3655

Regional Characteristics

Population of Wisconsin: 5,363,675

of MMHATs in State: 101,465

% of Housing Stock: 4.4%

Own MMHATs: 65%

Rent MMHATs: 12%

Vacant MMHATs: 23%

Median Household Income: \$43,791

Summary

The Tomorrow's Home Foundation is a statewide non-profit in Wisconsin created by the Wisconsin Housing Alliance, an association of manufactured and modular housing industry members. It provides low interest home ownership loans to people with disabilities and also helps to provide critical repairs to MMHATs for low-income homeowners. For three years, beginning in 2000, the Foundation facilitated the salvage and recycling of MMHATs before asbestos testing issues became a problem and it no longer found it economically feasible to continue that program.

Background

In 2001, the Tomorrow's Home Foundation received a grant from the Wisconsin Department of Natural Resources for \$37,400 to remove and recycle old, abandoned, and uninhabitable MMHATs. The Foundation prioritized homes that were located in an environmentally sensitive area, visible from major roads, owned by low-income landowners and had a government official's support for the removal. As part of its grant funded project, the Foundation paid the entire cost of transporting, deconstructing, and salvaging materials from 100 MMHATs. After the grant ended, the Foundation continued this work for another year and a half and facilitated the deconstruction and

salvage of approximately 200 additional MMHATs.

In addition to the grant, other funding sources for the Foundation's work include auctions, raffles, and golf outing fundraisers. The primary funding source is contributions from members of the manufactured and modular housing industries who feel that by helping to address the reputation created by unattractive MMHATs, they will get more business. The Foundation's administrative costs are paid for by the Wisconsin Housing Alliance.

When it was directly engaged in the removal and disposal of MMHATs, the Foundation contracted with three different companies to deconstruct the homes, salvage components, and dispose of waste materials. The three contractors had different equipment and worked in different parts of the state. When the Foundation's main contractor began requiring structures to be pre-certified as asbestos-free, the Foundation could not afford the additional cost and they ended their direct involvement with removal of structures. The Foundation had also found transportation costs and the bidding process to be extremely costly and complicated. Currently, the Foundation acts as a referral service for individuals who need to dispose of a structure, connecting them with companies that do deconstruction and salvage.

The largest contractor used by the Tomorrow's Home Foundation is Samuel's Recycling, a for-profit company that has seven dedicated facilities in various cities in the Midwest. Most of its facilities are in Wisconsin. The company was founded in 1896 and focuses on metals recycling, though it also recycles paper and has started recycling glass and plastics. Though it used to accept all MMHATs, Samuel's Recycling has changed its policy and now only accept MMHATs that are certified as asbestos free.

Darryl Craig also worked with the Tomorrow's Home Foundation, providing on-site deconstruction of MMHATs. He has a local handyman service in the Adams County area. He is only focused on salvaging metals, but his employees will sometimes take other materials if they have use for them at home. The MMHATs that Craig deconstructed were all ones that could not be towed. He has deconstructed between 35 and 50 MMHATs.

Bill Dolan also worked with Tomorrow's Home Foundation deconstructing MMHATs in Central and Southern Wisconsin. He runs a container service for disposal of large volumes of materials. He also owns a truck with a grapple and uses this to deconstruct homes on-site. His operation is small, with only a few employees. He deconstructs between 10 and 12 MMHATs a year.

Relevant Policies

- State waste management division allows manufactured housing association members to dispose of MMHATs for low cost of \$250 for 12' wide, \$400 for 14' wide, and \$625 for 16' wide. This may negatively affect the competitiveness of salvage and recycling programs.

Administrative Vitals

- **Year Started:** 2000
- **Size of Operation:** Processed approximately 300 MMHATs over three years
- **Permits Held:** N/A
- **Operating Budget:** Unknown
- **Number of Employees:** One full-time employee who hired various contractors for deconstruction
- **Price Rates for Contractors:** \$350 at Samuel's Recycling; \$650 to \$1500 for Bill Dolan or Darryl Craig
- **Pay Rates for Labor:** Varies by landfill \$39/ton (per interview with Darryl Craig) to \$42/ton (per interview with Bill Dolan)
- **Special Training:** None
- **Municipal Contracts:** None
- **Tipping Fees:** Varies by landfill \$39 to \$42 per ton; varies by landfill
- **Percent Pre-HUD code MMHATs:** 100%

Processing Methods

Obtaining Units

The Tomorrow's Home Foundation placed advertisements in local newspapers inviting people to call the Foundation if they were aware of MMHATs that needed to be disposed of. Owners called about their own homes and other individuals called when they noticed abandoned MMHATs that needed to be disposed. If the person who called was not the owner, the next step for the Foundation was to contact the owner. If the owner was not interested in having the home deconstructed, no action was taken. When the homeowner was low-income and wanted the home disposed of, the Tomorrow's Home Foundation would make arrangements for the home to be towed to Samuel's or to have it deconstructed on-site by one of the other contractors.

The Foundation and the owner both signed a form stating that the owner wanted the home disposed of and that it had no economic value (Appendix A). This document protected the Foundation from any future liability issues in case the owner changed their mind. The Tomorrow's Home Foundation also went through a process to eliminate the MMHAT title from state records. The Tomorrow's Home Foundation paid for transportation costs when MMHATs had to be moved to the contractor's facility.

Deconstruction Processes

Each organization contracted to deconstruct the homes used its own method. Each reportedly achieves a 30% diversion rate.

Samuel's Recycling begins its deconstruction process by accepting the delivery of a structure at one of its facilities. The crew breaks the structure into smaller parts with either a grapple or a crane shear. They then feed these smaller parts into a shredder. Materials are sorted after shredding on conveyor belts with mechanical and manual labor. Ferrous metals are baled, while non-ferrous metals are baled or bricked. The process takes less than an hour. Currently Samuel's only accepts structures that are gutted—leaving only a shell- and that are certified free of hazardous materials such as asbestos. Before this change of policy, MMHATs were delivered with the interior intact.

Darryl Craig uses a clam truck and semi-truck to deconstruct MMHATs on-site. The term clam truck refers to the type of grabbing device on the back of the truck. Craig uses the grabbing device to disassemble the structure piece by piece. He focuses on salvaging metals.

Bill Dolan uses his truck and grapple and manual labor to do on-site deconstruction of MMHATs. When the structure can be hauled, he will take it to the landfill. He needs only a dumpster on the site, which keeps permitting requirements to a minimum. He usually has about four people working with him. He guts the inside and has the roof collapse straight down to the floor. He will then take the ceiling apart before the first day is done. If everything goes well, he can finish cleaning up and removing the flooring and dismantle the frame on the second day.

Next Steps

Samuel's Recycling sells ferrous metals in the Midwest and sells non-ferrous metals both in the US and as an export. Other materials are taken to a landfill.

Bill Dolan salvages windows, and other people take other materials such as lumber, but they are not collected and sold for profit. Dolan only salvages metals for resale. He burns the scrap wood. Other components are taken to the landfill.

MMHAT Materials Salvaged: <ul style="list-style-type: none"> • Aluminum siding • Steel framing • Galvanized steel • Copper piping • Sheet iron • Lumber (occasionally) 	MMHAT Materials Disposed: <ul style="list-style-type: none"> • Fixtures • Insulation • Paneling • Flooring
Location of Markets: <ul style="list-style-type: none"> • Varies by Contractor 	Location of Landfill: <ul style="list-style-type: none"> • Varies by Contractor

Notable Successes

- Enabled low-income residents to dispose of unwanted structures
- Leveraged support and obtained lasting involvement of manufactured housing industry in MMHAT recycling
- Compiled a database of MMHATs transporters
- Impacted 27 counties
- Innovative reuse of steel frames to build walking bridges and storage buildings

Keep Liberty County Beautiful

Liberty County, Georgia

Contact Information

Keep Liberty County Beautiful
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Executive Director

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Regional Characteristics

Population of Liberty County:
61,610

of MMHATs in County: 5,366

% of Housing Stock: 24%

Own MMHATs: 37%

Rent MMHATs: 43%

Vacant MMHATs: 20%

Median Household Income: \$33,477

Summary

Keep Liberty County Beautiful is an affiliate of the national non-profit litter prevention, waste reduction, and beautification organization, Keep America Beautiful. Keep Liberty County Beautiful operates under the auspices of Liberty County, Georgia. It engages in a variety of clean-up activities, including an aggressive MMHAT abatement program. It works with cities in the county to finance voluntary abatement of privately owned MMHATs. It also works with cities to adopt nuisance abatement ordinances to enforce clean-up efforts. Keep Liberty County Beautiful contracts with independent crews for on-site deconstruction and salvage of MMHATs.

Background

In 2004, the county seat, Hinesville, pledged an initial \$45,000 (and ultimately contributed \$60,000) to support a local MMHAT clean-up as part of the Great American Clean-up

Campaign. This investment and the positive publicity resulting from the beautification has led to MMHAT abatement work in the jurisdictions of Midway, Riceboro, Gumbranch, Flemington, Walthourville, and a private development, Hampton Island, as well as in unincorporated parts of Liberty County. Jurisdictions, the County Development Authority, and local citizens donate funds to support the clean-up campaigns. At first, MMHAT abatement efforts were voluntary, where owners agreed to have Keep Liberty County Beautiful deal with their unwanted structures for a minimal fee. Now, Keep Liberty County Beautiful is working with cities to adopt nuisance abatement ordinances to force owners to deal with their dilapidated structures.

Relevant Policies

- State DOT does not allow pre-HUD MMHATs (structures built before 1976) on the road because it considers them unsafe to be transported.
- County Nuisance Abatement Ordinance; some smaller jurisdictions in the county have also adopted nuisance abatement ordinances.
- Keep Liberty County Beautiful is working with surrounding counties to lobby the state legislature to institute a fee assessment on MMHAT manufacturers to cover end of life disposal costs

Administrative Vitals

- **Year Started:** 2004
- **Size of Operation:** Have processed over 100 MMHATs
- **Permits Held:** N/A
- **Operating Budget:** Budgets are set for individual jurisdictions' clean up projects
- **Number of Employees:** One administrator; hires two contractors with three and four person crews, respectively
- **Pay Rates for Labor:** Low-wage, mostly Mexican immigrants
- **Price Rate for Contractors:** \$600/single wide and \$800/double wide
- **Special Training:** On-the-job training
- **Municipal Contracts:** Informal work agreements are reached
- **Tipping Fees:** \$200-\$300/roll off; 1-2 roll offs/singlewide
- **Percent Pre-HUD code MMHATs:** 80%

Processing Methods

Obtaining Structures

Jurisdictions in Liberty County invite Keep Liberty County Beautiful to lead their local MMHAT clean-up programs. Director Flournoy surveys the city to assess the necessary abatement and gives the city an estimate on the cost of clean-up depending on the number and type of homes and their condition; in the year that they have been in operation Flournoy has learned what it takes to complete an abatement project. She assesses a \$1200 cost for abatement of a doublewide MMHAT. If the home is full of junk, an additional \$200 is charged; trailer add-ons also cost an extra \$200. She reaches an informal agreement with the jurisdiction contributing towards a particular abatement project (e.g. \$6,000 from Hampton Island for abatement of

six MMHATs). The total number of structures that can be abated is dependent on the total amount of money donated from the jurisdiction and private residents.

Owners must sign a release and covenant not to sue, surrendering all rights, title, and interest in the structure to Keep Liberty County Beautiful (Appendix B). Keep Liberty County Beautiful also files paperwork with the tax assessor's office and secretary of state's office to remove the structure from the tax docket and registration records (Appendix C). 80% of owners contribute a token amount to the cost of the abatement. Typical contributions are \$100/single wide and \$200/double wide or more if the structure is full of stuff or has an add-on. Abatement of structures that belong to owners in extreme economic hardship is completely subsidized.

Liberty County also has a nuisance abatement ordinance that is enforced to get people to deal with dilapidated structures. It is currently being used for MMHATs for the first time with ten owners that would not voluntarily join the clean-up program. The owners are being taken to court to comply with the ordinance. Homeowners will either have to surrender their MMHAT and pay for the clean-up or let the county take their structure. In the latter case, the county will clean-up and attach a lien to the property so that the money will go back to the county when it sells, thereby ensuring that the public does not pay for the clean-up.

Deconstruction Process

Contractors are paid \$600/single wide and \$800/double wide for the deconstruction, salvage, and disposal of MMHATs. One of the contractors uses a tractor and back-hoe to pull homes out as needed; for example, if the structure has become overgrown with brush. The contractor then precedes with hand deconstruction methods. The other contractor only uses hand deconstruction methods. Acetylene torches are used to cut up the chassis. It takes an average of 24-48 hrs for four workers to process one single wide. All deconstruction and salvage work is completed on-site.

Next Steps

The contractors keep all profits from the sale of reusable and recyclable materials. This works as an incentive for them to divert a large amount of material. A South Carolina metal recycling company provides the contractors with a container for collecting scrap metal. The company picks up the full container once a month and pays the contractors for the contents. The contractors also have their own junkyards for resale of reusable items. Keep Liberty County acts as informal referral service for people seeking used parts.

<p>MMHAT Materials Salvaged:</p> <ul style="list-style-type: none"> • Tin • Steel • Wood • Copper Wiring • Toilets/Sinks/Baths • Appliances • Windows and Doors 	<p>MMHAT Materials Disposed:</p> <ul style="list-style-type: none"> • Interior paneling • Decking on the bottom of chassis • Cabinets • Insulation • 1x4 trusses
<p>Location of Markets:</p> <ul style="list-style-type: none"> • Metals- South Carolina • Reusable materials- Deconstruction contractor's salvage yard in neighboring county 	<p>Location of Landfill:</p> <ul style="list-style-type: none"> • Broadhurst Landfill in Jessup, Georgia • Superior Landfill & Recycling Center in Savannah, Georgia

Notable Successes

- 60% Diversion Rate
- Financial support from county, cities, and individuals
- Won national 1st place award in 2004 for Waste Reduction in the Nonprofit, Civic and Community Organizations category from Keep America Beautiful.

Salvage King Incorporated

Chatham County, North Carolina

Contact Information

Salvage King Inc.
Stephen Bower
Owner

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Staley NC 27355

Phone: 336-622-1595

Regional Characteristics

Population of Chatham County: 49,329

of MMHATs in County: 4,306

% of Housing Stock: 20%

Own MMHATs: 67%

Rent MMHATs: 25%

Vacant MMHATs: 8%

Household Median Income: \$42,851

Summary

Salvage King is a privately owned business that is primarily engaged in the deconstruction and salvage of MMHATs and RVs; the business has also dabbled in rehabilitation.

Salvage King operates out of Staley, North Carolina on a four-acre parcel that is permitted as a junkyard.

Resale of salvaged items occurs on-site. Salvage King offers both off- and on-site MMHAT deconstruction services. Most of the work is done out of state through large insurance contracts. The business is not currently sustainable and the owner has other small business ventures to subsidize his income.

Background

The owner previously worked in the MMHAT siting industry. In 1999, he received a \$10,000 grant from the State of North Carolina to help him establish his business. Since then, he has explored a number of different projects related to rehabilitation and salvage of MMHATs. He has explored the idea of rehabilitating MMHATs into offices, but he found that the professional engineering services required make it cost prohibitive. His efforts to rehabilitate older structures for residential use have also been stymied because certain jurisdictions do not allow older structures (pre-1976) to be sited. Bower has also made some preliminary investigation into recycling insulation. He spoke with engineers at DOW Chemicals about breaking it down and using it in concrete but the project has not been pursued.

Relevant Policies

- Facility is permitted under Chatham County junkyard code
- Cannot rehabilitate MMHATs for storage in North Carolina unless plumbing and insulation is removed.

- County will not provide power to a new MMHAT if an old unused MMHAT is still sited on the property.
- Some jurisdictions in the area (Siler City and Pittsboro) will not allow MMHATs older than 1976 to be sited.
- North Carolina state legislature introduced and has pending one bill in the senate, SB 913, and two bills in the house, HB 894 and HB 1288, related to MMHAT disposal in the 2005 session. The bills seek to impose an advance disposal tax on the sale of new and used MMHATs and to require counties to plan for the deconstruction of abandoned homes and the removal of reusable and recyclable components.

Administrative Vitals

- **Year Started:** 1998
- **Size of Operation:** Processes approximately 100 homes/year
- **Permits Held:** Junkyard permit from County; moving permit from the county that covers 12' wide structures; individual trip permits for 14' wide structures are \$28 (moving permits ensure that taxes have been paid on MMHATs)
- **Operating Budget:** Unknown
- **Number of Employees:** One (son) at present; had up to five when using mechanized methods that required more sorting
- **Pay Rates for Labor:** \$75/day to start, \$125/day for senior workers (summertime work days are 8 hrs, winter can be less)
- **Special Training:** Owner provides on-the-job training; has high turnover rate
- **Municipal Contracts:** None
- **Tipping Fees:** \$100/roll off; 3 roll offs/single wide; \$46/ton at the transfer station vs. \$60/20 yards at the C&D landfill
- **Percent Pre-HUD code MMHATs:** Used to be 98-99% pre-HUD, now doing 35% 14' wide structures (made around 1978) as these structures are now reaching the end of their useful lives

Facility Information

- Four acres
- Deconstruction and salvage performed outside
- All resale materials stored outside
- Resale of reusable items to public on-site

Processing Methods

Obtaining Structures

Salvage King is a fee driven business. Insurance companies have historically been a large part of the clientele. Insurance policies include variable coverage for debris removal in the event of disasters; hurricanes are common in the area. The amount of coverage for debris removal varies by state. In North Carolina coverage is \$50, it is \$2,000 in other neighboring states, and is \$3,500 in South Carolina. Much of Salvage King's work is done in other states because of the contracts obtained from insurance companies. Local individuals also pay for the service, in many cases motivated by the county practice of not turning on power for new structure until old property is removed. A nuisance abatement ordinance in Chatham County is also enforced. The county code enforcement officer advertises Salvage King services in the course of noticing incompliant property owners.

Salvage King charges variable rates depending on whether it is an on-site or off-site job and depending on the size of the structure. Salvage King provides towing services for MMHATs that are deconstructed off-site at the facility. For deconstruction and towing services, Salvage King charges \$750/12' single wide and \$950/14' single wide structures within 25 miles of the facility. \$100 is added for every additional 25 miles of towing. Salvage King charges two and a half times more for processing doublewides because they are more labor intensive and it is not equivalent to doing two singlewides. Salvage King charges \$2,450 for a double wide that is road worthy and \$3,500 for a double wide that requires on-site deconstruction.

Salvage King makes more money from on-site jobs, but carries more liability. When doing on-site deconstruction, the site is considered an attractive nuisance by code. Salvage King is liable if someone enters the site and is injured. Salvage King must set a fence around the property under its insurance policy. The advantages to taking MMHATs to the junkyard facility is that there is less potential for trespassing and equipment can be kept on-site. Owners sometimes try to give Salvage King their homes, but the Salvage King will not accept structures without payment.

Deconstruction Process

The MMHATs are deconstructed by hand, whether the job is done on-site or at the facility. Formerly, Salvage King experimented with more mechanized processes, but it resulted in a lower diversion rate. Salvage King employed more people when using a mechanized process to sort materials after deconstruction. Using hand deconstruction methods, it takes a week for two people to deconstruct a structure.

If there is a lot of black mold in the structure, the workers wear respirators while removing the appliances. In these circumstances, the rest of the structure is not worth salvaging and is landfilled.

Salvage King has done many tests for asbestos over the years, but has stopped for several reasons, despite the fact that asbestos surveys are required under federal law. First, the tests have never detected the presence of ACM- asbestos containing materials (in either pre- or post-HUD). Owner Stephen Bower believes ACM would only be present in MMHATs that have had after-market ceiling tiles added, which he says he has never seen in an MMHAT. Second, there is no enforcement of asbestos testing regulations. Bower contends that the landfill, which Salvage King competes with, does not do tests on the MMHATs it demolishes. Third, it costs \$275 for an asbestos test. Finally, Bower believes that since Salvage King is only doing hand deconstruction, they are unlikely to unwittingly pulverize ACM.

Next Steps

Reusable parts are sold on-site. Recyclables are taken to a material recovery facility. Smoke detectors are stored or put into household waste which is not regulated. Salvage King is certified by the state to recycle Freon; it's pumped into a tank and Salvage King pays \$75 to get the tank cleaned out by a private company. Salvage King obtains such a small quantity of Freon per refrigerator that it has been filling two 35 gallon cylinders for the past two years.

<p>MMHAT Materials Salvaged:</p> <ul style="list-style-type: none"> • Steel • Wood • Toilets/sinks/baths • Appliances • Electrical Boxes • Windows and Doors 	<p>MMHAT Materials Disposed:</p> <ul style="list-style-type: none"> • Sheetrock • Carpets • Floors • Insulation
<p>Location of Markets:</p> <ul style="list-style-type: none"> • Metals- DH Griffin, Greensboro, North Carolina (http://www.dhgriffin.com/); ~25 miles from Staley Facility • On-site resale 	<p>Location of Landfill:</p> <ul style="list-style-type: none"> • Coble's Landfill; 15 miles away

Notable Successes

- 70-75% diversion rate
- Work in multiple states
- In business for over seven years

CMH Mobile Homes Saginaw, Michigan

Contact Information

CMH Mobile Homes
Bill Rappley
Owner

Saginaw, MI
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Chris Rappley
Son of Owner

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Regional Characteristics

Population of Mid Michigan area (nine counties): 1,164,106

of MMHATs in nine Mid-Michigan Counties: 37,647

Own MMHAT: 76%

Rent MMHATs: 12%

Vacant MMHATs: 12%

Median Household Income: \$43,269

Summary

CMH Mobile Homes is a for-profit MMHAT deconstruction and salvage operation located in Saginaw, Michigan. In about a year and a half of existence, CMH has processed approximately 60 structures. Most MMHATs are brought to the facility for deconstruction by private towing companies. Occasionally, the work team will deconstruct a structure on-site, per court ordered contracts. Park owners and homeowners pay to have the MMHATs hauled away and processed. CMH primarily deconstructs structures by hand. CMH collects the salvageable materials and sells them to a scrap processing facility 28 miles away. CMH also does some resale of salvaged items out of a small shop on the property. Diversion rates are estimated at approximately 30-40%. Leftover items are disposed of in a landfill

22 miles away. The operation is currently operating at a loss; however, the owner expects to turn a profit soon.

Background

CMH is owned and operated by Bill Rappley, a businessman with a 30-year career in the scrap metal business. He began his MMHAT deconstruction and salvage business in 2004 after recognizing the potential for reclaiming old trailers. Rappley is in the process of buying the land on which his facility is located, and which he previously leased for his scrap metal business. Rappley did not need to obtain special land use permits for this facility because the land is zoned for light industrial uses. The DEQ granted CMH the first license in the state to accept MMHATs for deconstruction and salvage.

Rappley is considering offering a month of free services to people from the local village who want to recycle their MMHATs “to clean the area up and get some good advertising.” Rappley also mentioned that it has been difficult working with some mobile home park operators and that the manufactured home association has a lot of political power in the state. He has recently started talking with them, as well as insurance adjusters. He is also quite interested in learning how he can increase mechanical operation to be more efficient.

Relevant Policies

- The DEQ requires businesses that engage in deconstruction and salvage of MMHATs to operate in an enclosed facility to prevent the inadvertent release of various materials.
- According to Rappley, the DEQ has been promoting the clean-up of sites with abandoned or out-dated MMHATs for environmental reasons.
- CMH has also benefited from municipalities that are utilizing nuisance abatement ordinances and cracking down on zoning and tax violations (i.e. two dwellings on a lot zoned for one). These actions have led to increased numbers of MMHATs for CMH to process.

Administrative Vitals

- **Year Started:** 2004
- **Size of Operation:** Process about 60 MMHATs a year
- **Permits Held:** Industrial Processing (junkyard)
- **Operating Budget:** Unknown
- **Number of Employees:** Six
- **Pay Rates for Labor:** Three laborers paid \$6/hr; Mechanic \$8/hr; Truck Driver \$10/hr
- **Special Training:** Provide on-the-job training provided
- **Municipal Contracts:** Receives contracts on court orders
- **Local Tipping Fees:** \$1175/MMHAT
- **Percent Pre-HUD code MMHATs:** Unknown

Facility Information

- Located on five acres
- Owner is in the process of purchasing land which he has leased for several years
- Three buildings on the land- administrative, resale shop (2000 sq ft), and deconstruction building

- Primary equipment: Bobcat, loading truck, fork truck

Processing Methods

Obtaining Structures

Mobile home park owners and individual homeowners pay CMH to haul their structures to the deconstruction and salvage facility. CMH arranges for all hauling and charges according to the size of the structure, hauling distance, and the amount of prep work necessary to make the structures roadworthy. According to Rappley, the average cost to move a 14'x 70' wide structure is roughly \$1400-1500. The state of Michigan requires that haulers obtain trip permits (\$15) to move the structures.

Approximately 10% of all CMH's jobs stem from court-writ foreclosures and approximately 10% come from zoning violations. Municipalities pay for these jobs. CMH completes these jobs on-site and generally charges additional fees for clean-up of the site. According to the Rappley, they have yet to run into asbestos or hazardous materials. He believes that the CMH staff is fully capable of recognizing asbestos because of their previous involvement with large scale processing. Regardless, asbestos surveys are required under federal law prior to deconstruction of these structures.

Deconstruction Process

Saleable goods are salvaged (furnaces, windows, appliances, fixtures) by hand. A Bobcat with grappling hooks is occasionally used to move structures around and for stripping the shell from the frame. A 14' x 70' wide solidly constructed structure will take four men approximately 1.5 days to deconstruct it. The better constructed the structure is, the longer it takes to deconstruct. Some of the poorly constructed structures can be deconstructed in just half a day.

Next Steps

Salvaged materials are resold at the facility to MMHAT homeowners in the area, some handymen, and to some trailer park owners. Rappley hires a contractor to come in with a chipper and turn the wood waste into chips, which are then sold for landscaping. Metals are separated and sold at a scrap metal processing facility 28 miles away. The remaining materials are disposed of at a landfill approximately 30 miles away.

<p>MMHAT Materials Salvaged:</p> <ul style="list-style-type: none"> • Aluminum • Steel • Some Wood • Fixtures 	<p>MMHAT Materials Disposed:</p> <ul style="list-style-type: none"> • Insulation • Contaminated Wood • Glass • Plastic Piping
<p>Location of Markets:</p> <ul style="list-style-type: none"> • Scrap metal dealers are 28 miles away • On-site resale 	<p>Location of Landfill:</p> <ul style="list-style-type: none"> • Landfill is 22 miles away

Notable Successes

- 30-40% diversion rate
- Close to being profitable
- Lots of DEQ support
- Court-ordered jobs have been lucrative

Zanker Road Landfill and Materials Processing Facility

San Jose, California

Contact Information

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Regional Characteristics

Combined Population of San Mateo
and Santa Clara Counties: 2,389,746

of MMHATs in Two Counties: 22,071

Own MMHATs: 85%

Rent MMHATs: 12%

Vacant MMHATs: 3%

Median Household Income: \$72,577

Summary

Zanker Road Landfill and Zanker Materials Processing Facility are adjacent for-profit operations in San Jose, California. The facilities process construction and demolition (C&D) debris and accept approximately 15 MMHATs per month. All MMHATs are delivered by towing services to the materials processing facility (MPF) and undergo a complex mechanical process that crushes and sorts their components. Materials are then either sent to market to be recycled or further processed at the MPF to be sold directly to local consumers. Little or no reuse of materials is conducted.

MMHATs make up just a tiny

fraction (.04%) of all materials processed at the facility. The operation, as a whole, is profitable and reports a diversion rate of approximately 80% on MMHATs. MMHATs account for 10-18% of the overall profit. These successes can be attributed, at least in part, to California law requiring high rates of recycling for its cities and counties.

Background

Zanker began in 1985 as a C&D landfill owned and operated by Zanker Road Resource Management Ltd., a partnership of three local businessmen. The business received some additional private investments and, in 1990, began the permitting process for an MPF to be located on the former Owens Corning Landfill. The partnership was finally permitted in 1998 and began operations in 1999. Zanker has made several revisions in the mechanical operation of its MPF since 1985. The MPF received the first MMHATs in 2000. Since 2003, when computer tracking of processed MMHATs began, the MPF has

processed 490 structures weighing a combined total of 2255 tons. Zanker also owns a green waste processing facility in nearby Gilroy, CA, which contracts with the City of San Jose for residential pick-up.

Relevant Policies

- **AB 939:** The Integrated Waste Management Act of 1989 mandates 50% waste reduction for California’s cities and counties.

Administrative Vitals

- **Year Started:** 1985 (landfill); 1999 (MPF)
- **Size of Operation:** Process about 175 MMHATs a year
- **Permits Held:** Class III Landfill; Materials Processing Facility
- **Operating Budget:** Approximately (\$15 million)
- **Number of Employees:** About 90 people are employed at both facilities combined
- **Pay Rates for Labor:** Varies; Many employed full-time with benefits, except equipment operators
- **Special Training:** On-the-job training
- **Municipal Contracts:** None. (City of San Jose for green waste only)
- **Zanker Tipping Fees:** \$95/Ton. \$8/tire, \$30/appliance
- **Percent Pre-HUD code MMHATs:** Unknown

Facility Information

Landfill	Materials Processing Facility
<ul style="list-style-type: none"> • ZRRML owns • 40 acres • 25 employees • 4 buildings: (lunch room, storage facility, etc.) • Primary equipment: 220 Excavator, conveyor belt, the rocket, etc. 	<ul style="list-style-type: none"> • ZRRML owns • 45 acres • 70 employees • 3 buildings: (lunch room, storage facility, etc.) • Primary equipment: 220 Excavator, conveyor belt, the rocket, etc.

Processing Methods

Obtaining Structures

Owners of MMHATs pay towing companies to bring MMHATs to the Zanker MPF. It costs the towing company \$95/ton to bring MMHATs into the facility. Other nearby landfills charge less per ton, but they tack on handling fees (Kirby Canyon: \$200 handling; \$68/ton; \$12/tire;

\$22/appliance. Guadalupe: \$200 handling; \$60/ton). Zanker weighs the structures and records their weight. The percent of pre-HUD MMHATs that are accepted at the facility is not known. Most structures come in on tires, rather than on the back of a truck.

Deconstruction Process

One employee at Zanker uses a 220 Excavator to dismantle the structure. Appliances may be removed by hand by another worker (sometimes with Excavator) and sent out to independent contractor to remove hazardous materials. Zanker pays the contractor who certifies and returns white goods to Zanker for recycling. Workers use the Excavator to strip the shell from the steel frame and crush the aluminum. They pull the wheels off and load debris directly into the Rocket. The Rocket separates materials via a floatation system. Wood rises to the top, is conveyed out, and separated from plastic which is generally discarded. Zanker can process 4-5 MMHATs/day.

Next Steps

Wood is ground and sold. Different qualities of wood have different destinations. Metal is transported to port and shipped to China to be melted. Raw metal is returned to Zanker and then sold. Gypsum is separated at the MPF and sold to farmers. The remaining materials are collected and either disposed of in the Zanker landfill or trucked to Potrero Hills Landfill.

<p>MMHAT Materials Salvaged:</p> <ul style="list-style-type: none"> • Aluminum • Steel • Wood • Gypsum 	<p>MMHAT Materials Disposed:</p> <ul style="list-style-type: none"> • Insulation • Glass • Plastic Piping
<p>Location of Markets:</p> <ul style="list-style-type: none"> • Simms Metal Recycling, 20 miles away. • Standards Iron and Metal, 20 miles away in Hayward 	<p>Location of Landfill:</p> <ul style="list-style-type: none"> • On-site • Potrero Hills Landfill, 75 miles away

Notable Successes

- 90% Diversion Rate
- Profitable operation
- Extended Life of Landfill > 20 years

Summary

The Tomorrow's Home Foundation, Keep Liberty County Beautiful, The Salvage King, CMH Mobile Homes, and Zanker Materials Processing Facility exemplify diverse examples of MMHAT deconstruction and salvage operations. Each operation has different advantages and limitations due to their geographic, socioeconomic, and legislative context. Their service scope ranges from a single county to a multi-state region. These operations represent different methods of financing MMHAT salvage operations, as well as different methods for how to deconstruct the structures. Not surprisingly, each operation has different outcomes in terms of the volumes of MMHATs processed, the diversion rates that are achieved, and their overall financial stability. While each program and business must be understood in context, it is also illustrative to compare the factors and outcomes of these diverse examples. Table 7 provides an overview of the five case studies presented in this section and gives a comparison of their basic characteristics.

Table 7: A Comparison of Deconstruction and Salvage Operation Case Studies

Case Study and Geographic Service Area	Type of Operation	Years in Existence	# MMHATs Processed	Business Model	Deconstruction and Salvage Methods	Materials Salvaged/ Markets	Outcomes	Advantages & Limitations
Tomorrow's Home Foundation Madison, WI (Statewide)	Non-Profit Program; run by statewide non-profit organization	2000-2002	~300 total	State and Manufactured Housing Industry funding; MMHATs donated; on-site and at-facility processing.	Hired 3 contractors that used a range of methods.	Metals	30% diversion rate; program no longer operating.	Advantages: Manufactured Housing Industry and State funding Limitations: Asbestos certification costs
Keep Liberty County Beautiful Liberty County, GA (Countywide)	Non-Profit Program; affiliate of national non-profit organization	2004-Present	~100 total	Local government and individual funding; MMHAT owners pay small amount (\$100-\$300); on-site processing.	Hires two different contractors based on needs—one does all by hand, the other uses some machinery.	Metals, wood, reusable items	60% diversion rate; Smaller jurisdictions in county are working with program following success in county seat	Advantages: Public/private donations; nuisance abatement ordinances; low wages Limitations: Dependent upon donations
Salvage King Staley, NC (Multi-State Region)	For-Profit Deconstruction & Salvage Business	1998-Present	~100/yr	Self-funded; MMHAT owners pay; on-site and at-facility processing.	Mostly by hand, used to be more mechanized.	Metals, wood, reusable items (~25 miles and at facility)	70-75% diversion rate; MMHAT deconstruction & salvage not currently profitable.	Advantages: High volume; insurance contracts; nuisance abatement ordinance. Limitations: Accumulation of salvaged goods; MMHAT salvage not currently profitable.
CMH Mobile Homes Saginaw, MI (Mid-Michigan Region)	For-Profit Deconstruction & Salvage Business	2004-Present	~60 total	Self-funded; hauling companies pay; mostly at-facility processing.	80% Hand 20% Mechanical	Metals, wood, reusable items (~30 miles and at facility)	30-40% diversion rate; not currently profitable but getting closer.	Advantages: Court-ordered clean ups; low wages; high tipping fees (\$1175); close markets. Limitations: Not yet profitable.
Zanker Materials Processing Facility San Jose, CA (Multi-County)	For-Profit Construction & Demolition Landfill and Materials Processing Facility	Landfill (1982-present) MPF (1999-present)	10-15/month	Private investments; hauling companies pay (\$95/ton, \$8/tire, \$30/appliance); at-facility processing only.	Highly mechanized; hand sorting as well.	Metals, wood, gypsum, some plastics (~20 miles and at facility)	80-90% diversion rate; profitable operation.	Advantages: AB 939; economies of scale; close markets; manufactured housing industry incentives; high volume. Limitations: ?

Key Considerations

The diversity of the case studies reviewed in this report demonstrates that there is no one right way to run a MMHAT deconstruction and salvage operation. For every aspect of an operation, including financing, obtaining MMHATs, and deconstructing the structures, there are alternative strategies to choose from. Choosing the methods to employ should be based on the goals and capacity of the organization that is undertaking the operation. Selecting appropriate strategies will also depend on assessing the unique opportunities and limitations that are available to a given deconstruction and salvage operation because of its location.

To illustrate the series of decisions that must be made in establishing a MMHAT deconstruction and salvage operation, CPW developed a list of key considerations. For each of the major elements of the operation (in bold), a question is posed that highlights a decision that must be made or a condition that must be assessed for any operation. Listed below each question are possible alternative responses to the question. Bulleted beneath each alternative are some of the factors that affect the alternatives, as well as some of their potential implications. The extent to which these factors line up with a certain operation's circumstances may provide direction as to which strategy is most appropriate for that operation. This list of factors is by no means exhaustive; it is merely intended to highlight major points that should be considered with each alternative. The listing of key considerations is presented in a linear format, but the strategies for an operation act in concert and should be selected as such.

Primary Goal: What is the mission of the deconstruction and salvage operation?

Operation is dedicated to achieving the highest diversion rate possible.

- A process that utilizes hand labor and specialized dismantling and sorting machinery can achieve very high diversion rates.
- Salvaging everything that can be reused or recycled may not be cost effective at a small scale (i.e., without specialized machinery) due to the salvage time involved and limited resale markets.

Operation is dedicated to achieving a self-supporting/profitable business.

- A large quantity of MMHATs is essential if deconstruction and salvage is the sole service performed by the business.
- Operations that diversify to do more than deconstruction and salvage of MMHATs may be more viable.

Operation is dedicated to serving low-income homeowners.

- Low-income homeowners will not be able to pay more than a token amount for the service and subsidies will be necessary.
- The operation will not be able to cover costs by charging fees for service.

Financing: How will the costs of processing each structure be covered?

Program costs will be subsidized.

- Public and government support of operation's mission must be established if they are to be solicited as financial contributors.
- Communities with significant proportions of obsolete MMHATs may be more supportive because of awareness of associated problems.
- Public and private donations can be used to cover costs for low-income homeowners.

Costs will be covered by fee for service.

- Self-financing depends on charging a rate that is competitive with other forms of disposal.
- Tipping fees at the landfill and rates of local demolition/transportation companies drive competitive rate.
- Rates of return on salvaged items add profit that can create a competitive advantage over traditional disposal options.

Disposal Policies: Are there policies in place that will support or hinder the operation?

Policies support the operation.

- Owners have an incentive to either improve or dispose of structures if neglect is prohibited by code.
- Nuisance abatement ordinances give local government enforcement power (court order) to dispose of structures that are neglected; costs can be recouped by placing lien on property.
- Deconstruction and salvage operations can seek contracts with local governments that enforce nuisance abatement ordinances.

Policies limit the options of the operation.

- Some state DOTs do not allow pre-HUD code homes to be on the road making on-site deconstruction necessary.
- A free disposal option for MMHAT damages the potential for charging for deconstruction and salvage services.

Methods: Will deconstruction and salvage be done by hand or using heavy machinery?

Hand deconstruction methods will be used.

- Hand deconstruction is more labor intensive, but may result in more salvaged reusable materials.
- Utilizing low-cost labor is most effective in viable hand deconstruction operations.

Mechanized deconstruction methods will be used.

- Are more time efficient, but require higher input volume of structures to be cost effective.
- Machinery, such as a metal shredder, requires substantial capital.

Facility: Will deconstruction and salvage be done at a dedicated facility or on-site?

A dedicated facility will be established.

- Facilities may be deemed Material Recovery Facilities or Junkyards; land use permitting restrictions and costs would apply.
- All equipment is centralized and secured; markets are at a fixed distance.
- MMHATs must be transported to the facility.

Deconstruction of structures will be performed on-site.

- Crew can go to location of structure, deconstruct unroadworthy structures.
- Unsecured job sites leave valuable salvageable items subject to theft.
- Job sites are attractive nuisances: if trespassers enter and cause injury to themselves, person responsible for deconstruction is liable.

Asbestos: How will the operation comply with asbestos testing regulations?

Only structures that have been pre-certified as asbestos free are accepted.

- Raises cost for entity (e.g., homeowner, government) disposing of structure; entity may seek cheaper disposal alternative.
- Simplifies operation in terms of state oversight, worker liability, and fee assessment.

All structures are accepted for deconstruction.

- Asbestos testing can be performed in house, which requires more training of workforce and involves more liability.
- Testing will marginally raise costs for deconstruction and salvage operation.
- Full abatement would add significant cost burden- difficult to assess fee prior to testing.

Chapter 6

Recommendations

The case studies presented in Chapter 5 illustrate a number of ways that public policies and private initiatives can support MMHAT salvage and recycling operations. These examples provide lessons for what conditions and partnerships could be particularly instrumental in supporting Heartwood's proposed operation. CPW developed the following recommendations in light of the current policies and opportunities that prevail in Douglas County and the state of Oregon.

1. Tipping Fees

In order for Heartwood to successfully command a fee from Douglas County homeowners for the service of accepting their unwanted MMHATs, the county landfill must charge tipping fees for construction and demolition waste. Otherwise, the option to dispose of an entire MMHAT in a landfill will be a cheaper alternative (and therefore a more attractive option) than engaging Heartwood to deconstruct and salvage its components. It is in the county's best interest to enact C&D tipping fees because the effect will be to divert more materials from the landfill for reuse and recycling, thereby extending the longevity of the landfill.

2. Enforcement of Regulations

State regulations that require landfills to accept only structures that are certified as asbestos free must be enforced. Heartwood's operation will be subject to the expenses of asbestos testing. In order for Heartwood to compete with landfills for unwanted MMHATs, enforcement of these regulations must be equitable.

Local jurisdictions have the opportunity to further Heartwood's efforts in a few ways. They can act as a referral service for Heartwood when MMHAT owners inquire about how to dispose of their structure. They can also provide direct support by obtaining MMHATs through the enforcement of regulations and by paying Heartwood to deconstruct and salvage the components of these structures. Listed below are a few regulations that could be enforced to Heartwood's benefit. It should be noted that all of the strategies listed below are dependent on jurisdictions having sufficient funding for oversight and enforcement. It is also important to understand that an unintentional consequence of these types of enforcement can be displacement of and financial burden upon low-income residents.

Nuisance abatement ordinances

Heartwood could seek to make arrangements with jurisdictions that have nuisance abatement ordinances (such as the City of Roseburg) to obtain MMHATs that do not comply with the ordinance. An

arrangement could work on multiple levels. First, the jurisdiction could notify homeowners of Heartwood's services in the process of noticing them for non-compliance. This referral could lead to homeowners engaging Heartwood directly. Secondly, the jurisdiction could use Heartwood as their preferred service provider in those instances where removal of a nuisance structure is court ordered and paid for by the city (with a lien on the property).

Tax violations

Heartwood could also benefit from tougher enforcement of tax violations. Homeowners that have not paid taxes on their structure are subject to court ordered foreclosure. In these instances, the local jurisdiction typically assumes responsibility for the structure. Heartwood could make arrangements to take these MMHATs for a fee to be paid by the jurisdiction

Zoning violations

Strict enforcement of zoning violations may result in an increased demand for disposal services by MMHAT owners. For instance, where two structures are on a single lot zoned as single family residential and where one is no longer in use, enforcement of the zoning regulation would likely result in the homeowner's decision to dispose of the secondary structure. Jurisdictions could refer homeowners that are cited with these types of zoning violations to Heartwood.

Utilities

Jurisdictions that provide electrical, gas, or water service can be encouraged to adopt a strategic policy of not providing service to new MMHATs on lots that still have old residential MMHATs sited on the property. This policy has the effect of motivating homeowners to dispose of their unused structure instead of abandoning it on-site. As part of this policy, jurisdictions could refer subject homeowners to Heartwood.

3. Support by Manufactured Housing Industry

Heartwood should seek the support of the Oregon Manufactured Housing Industry to help fund the deconstruction and salvage operation. Other state manufactured housing associations have supported similar programs due to their interest in removing unsightly MMHATs from the landscape. The Oregon association could similarly benefit the reputation of manufactured housing by investing in Heartwood's pioneering program.

4. Support by State and Local Jurisdictions

Heartwood should seek financial support for the deconstruction and salvage operation from both the state and local jurisdictions that will benefit from Heartwood's efforts. The Oregon Department of Energy will benefit from Heartwood's deconstruction and salvage operation because of their interest in removing energy inefficient structures from the grid.

The Oregon Department of Environmental Quality may have a two-fold interest in Heartwood's efforts. First, the DEQ may encounter the need to dispose of abandoned MMHATs in the course of doing environmental clean-up of sites around the state. Heartwood's operation would almost certainly provide the DEQ with an alternative that is preferable to disposal of these structures.

Secondly, the DEQ is responsible for the Opportunity to Recycle program which set a statewide recovery goal of 45% by 2005. Supporting Heartwood would further the Opportunity to Recycle goal. Local jurisdictions have a similar incentive to support Heartwood, as they are also committed to furthering salvage and recycling under the Opportunity to Recycle legislation.

If Oregon mandated recovery levels, rather than setting target goals, as has been done in California (AB 939), the government would have an even greater incentive to support Heartwood's deconstruction and salvage operation.

Summary: Mutual Interests

As noted, there are several ways in which specific public and private entities can support Heartwood's proposed MMHAT deconstruction and salvage operation. It is in the mutual interest of these parties to advance an initiative that provides an innovative response to the predicament presented by a significant number of obsolete MMHATs. As a pioneering program in the state of Oregon, Heartwood's foray into the deconstruction and salvage of MMHATs may also provide new insights into the opportunities that could be presented by this type of operation, such as job creation and clustered niche market development. Therefore, Heartwood may also anticipate discovering additional allies that will recognize the economic and ecological benefits of a viable MMHAT deconstruction and salvage operation in Douglas County.

Appendix A Tomorrow's Home Foundation Ownership Certification Form

CERTIFICATION IN ABSENCE OF HOME TITLE

I _____ certify that the value of all __ homes to be recycled through the Tomorrow's Home Foundation is \$0.00. I also certify that I am the official owner of this property and no other person can claim ownership. These homes are being recycled voluntarily per my request.

Signed _____ Date _____

Appendix B

Keep Liberty County Beautiful

Release Form

RELEASE AND COVENANT NOT TO SUE

I, _____, state
the following:

(1) I am over the age of 18,

(2) I am the owner of a mobile home described as follows:

(Describe property by year, make, model, registration number, etc.)

(3) This mobile home is presently located at:

(4) I am the sole owner of this mobile home and there are no other persons or entities having any interest in or lien against this property.

(5) I hereby abandon this property effectively immediately. I surrender all rights, title, and interest of any kind I have in this property to the Liberty County Clean and Beautiful Project.

(6) I request the Keep Liberty County Beautiful Project remove this mobile home from its current location and dispose of it in any manner as the Project deems fit and in their sole discretion, to include but not be limited to destruction of the property.

(7) I expect no compensation or reimbursement of any kind from any person or entity in exchange for my surrendering this mobile home to the Liberty County Clean and Beautiful Project.

(8) I am paying \$_____ to the Keep Liberty County Beautiful Project To be applied toward the cost of removal of this mobile home.

(9) I understand and agree that the Keep Liberty County Beautiful Project will assist me in removing this mobile home by obtaining the services of an independent contractor to tear-down and remove mobile

homes. I understand the Keep Liberty County Beautiful Project will pay the remainder and balance of any fees charged by the independent contractor, beyond the amount I am paying. I understand the independent contractor that performs this service is not affiliated with the municipal or county governments of the City of Hinesville or Liberty County and that this independent contractor will have the power and authority to remove this mobile home by whatever means they deem fit in their sole discretion.

(10) In consideration of the efforts the Keep Liberty County Beautiful Project will take to remove this mobile home free of charge to me, I do, for myself, my heirs, executors, administrators, assigns, and successors in interest (hereinafter "Releasing Parties"), hereby completely release, acquit and forever discharge the Keep Liberty County Beautiful Project, the City of Hinesville, Georgia, and the County of Liberty, Georgia, and all these entities' respective agents, present or former officers, directors, trustees, stockholders, parents, subsidiaries and corporate affiliates, divisions, predecessors, successors, assigns, attorneys, insurers, underwriters, representatives, elected officials, appointed officials, members, servants, independent contractors, employees and any other agents of the Keep Liberty County Beautiful Project, the City of Hinesville, and the County of Liberty and any and all other persons, firms, and companies including the independent contractor that removes the mobile home (hereinafter "Released Parties"), of and from any and all past, present, or future claims, demands, debts, charges, suits, actions, causes of action, rights, damages, costs, losses of services, hospital, medical, drug, physical therapy, and all other expenses and compensation of any nature whatsoever, whether based on a tort, contract, equity, or other theory of recovery, and whether for compensatory or punitive damages, which the Releasing Parties now have or which may hereafter accrue or otherwise be acquired on account of, or in any way growing out of or resulting from, any acts or omissions of the Released Parties.

(11) As a part of the consideration mentioned above, the Releasing Parties agrees to and does hereby INDEMNIFY AND HOLD HARMLESS the Released Parties, from any and all claims, demands, debts, charges, expenses, suits, actions and causes of action of whatsoever nature or character, including attorney's fees, which have been or may hereafter be asserted against the Released Parties arising out of, resulting from or in any manner connected with the mobile home described above. These claims, demands, debts, charges, expenses, suits, actions and causes of action include, but are not limited to, any and all claims for medical and hospital expenses; any and all subrogation claims, including without limitation, any claims of any respective third-party lien holder claiming an interest in the mobile home; contribution claims; indemnity claims; third party claims; any and all liens, including without limitation, any liens of any other governmental agency, attorneys, and any and all actions to enforce such

liens; any verdicts, judgments, and damages of any civil action brought by any person, business, firm, corporation or other entity as a result of such claims or liens.

SIGNATURE

Sworn to and subscribed before me

this _____ day of _____, 2005

Appendix C

Keep Liberty County Beautiful Tax Docket Removal Form

KEEP LIBERTY COUNTY BEAUTIFUL

MOBILE HOME ABATEMENT PROJECT

OWNER OF MOBILE HOME _____

TELEPHONE _____

ADDRESS _____

YEAR OF MOBILE HOME _____

LENGTH & WIDTH _____

MODEL NAME _____

MANUFACTURERS I.D. # _____

DECAL # _____

PROPERTY OWNER _____

FORMER OWNER _____

Appendix D

Exploded Drawing of Angeles Mobile Home