**Waste Collection & Disposal Services**

**Industrials – Commercial Services**

<table>
<thead>
<tr>
<th>Investment Thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>We recommend a market weight position for the waste management industry due to the staple service it provides, its record of stable earnings and its relatively low correlation with the overall market. These attributes make it a solid defensive holding. The industry’s primary challenge is its high degree of rivalry due to the large number of players who compete aggressively on price. This, however is being mitigated by the trend of consolidation and vertical integration which is allowing industry players to retain more revenues.</td>
</tr>
</tbody>
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**Drivers of Thesis**

- Municipalities are expected to continue privatizing waste collection and disposal services. Municipal divestment creates the potential for the current private market to expand by as much as 33% over the long term.

- Industry trend of consolidation and vertical integration will allow industry players to retain more of the industry’s revenues

- The competitive advantages of integration and the high capital intensity of the industry serve as deterrents to new entrants.

- Solid waste disposal remains a staple and total solid waste disposal volume will continue to grow albeit slowly with population.

**Risks to Thesis**

- More stringent regulations could potentially increase landfill operating cost which would have a negative ripple effect throughout the industry.

- Recycling or composting rates could increase substantially due to legislation or increased commodity prices.

<table>
<thead>
<tr>
<th>Price Data</th>
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<tbody>
<tr>
<td>Current Price</td>
</tr>
<tr>
<td>52wk Range</td>
</tr>
<tr>
<td>Yield</td>
</tr>
<tr>
<td>3Yr Avg. Ret</td>
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<tr>
<td>P/E</td>
</tr>
<tr>
<td>Beta</td>
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<table>
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<tr>
<th>Key Index Statistics</th>
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<tr>
<td><strong>Market weight</strong></td>
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<table>
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<tr>
<th>Major Companies by Market Capitalization</th>
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<tr>
<td>Waste Connections Inc.</td>
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<tr>
<td>Republic Services Inc.</td>
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<tr>
<td>Waste Management</td>
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<tr>
<td>Progressive Waste Sol</td>
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**Profitability**

- Operating Margin | 11.55% |
- Profit Margin | 6.12% |
- Return on Assets (TTM) | 4.28% |
- Return on Equity (TTM) | 12.12% |

**Industry Description**

Firms in the domestic waste management industry collect, transport and dispose of non-hazardous waste from households and industries. These firms typically transport waste to landfills via trucks and/or transfer stations. The primary customers in this industry are municipalities and businesses. Firms in this industry also earn revenue from selling recycled materials or offering fee based recycling services.

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**12 Month Performance**

![Graph showing 12 Month Performance](source: Yahoo Finance)

**Source:** Yahoo Finance, FactSet

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Important disclosures appear on the last page of this report.
EXECUTIVE SUMMARY

The waste management industry is an industrial staple due to the necessity of waste disposal services, however the industry is not without its challenges. There are a large number of small regional players who compete aggressively on price. Legislation could also enable recycling and other substitutes to reduce waste disposal volumes or increase landfill disposal costs. In the short term the industry is constrained by macroeconomic headwinds such as low inflation and lower manufacturing activity which is limiting revenue growth.

The industry’s risks are mitigated by the strong trend of consolidation and integration which will continue to slowly reduce competition in the industry. The persistent privatization of waste collection services also presents an attractive growth opportunity for the industry.

We believe that the industry's three largest players; Waste Management, Republic Services and Waste Connections are best positioned to capture industry profits due to their large scale and high degree of vertical integration.

INDUSTRY DESCRIPTION

The domestic waste collection and disposal industry generates approximately $49 billion in revenue annually, 45% of which is controlled by three large publicly traded firms; Waste Management Inc., Republic Services Inc. and Waste Connections Inc. Despite the presence of these large public players the industry remains relatively fragmented, particularly in regional areas where there are thousands of private small to midsized operators. These small private operations account for approximately 30% of the market while the other approximately 25% consists of municipalities that manage their own waste. During the past two decades the industry has experienced significant consolidation and M&A activity as large publicly traded firms increase market share through acquisition.

Domestic waste managers earn revenue primarily through collection, transfer and disposal of waste generated by households and businesses. Additional income is also earned through selling recycled waste products or through recycling fees.

Waste Collection

Waste collection accounts for approximately 61% of industry revenue. Firms in this industry typically enter into long term contracts with municipalities which grant them the exclusive right to provide waste collection services in the municipality for a stipulated period of time. Most municipal contracts last between 3 and 10 years and are subject to a competitive bidding process at expiration. Firms in this industry also earn a sizable amount of revenue from waste collection contracts with commercial and industrial customers.

Waste Transfer Services

After waste is collected it is usually hauled via trucks to a transfer station where it is compacted and transported via rail, trailer or barge to a landfill for disposal. Firms that do not control their own transfer stations must pay owners a tipping fee to gain access. Transfer stations are particularly important for firms that collect waste in areas that are not in close proximity to landfills or other disposal sites. Having control of transfer stations provide firms with a competitive advantage and all three large players have vertically integrated by either purchasing or building a large network of transfer stations. Landfill owners who own distant disposal sites also use transfer stations strategically, to access waste from distant and otherwise unfeasible markets.

Landfill Disposal Services

Landfills store the bulk of the USA’s solid waste and consequently they are subject to heavy regulation from federal, state and local authorities. The Resource Conservation and Recovery Act (RCRA) passed in 1976 mandated costly upkeep requirements to ensure that
landfills did not pose a public health hazard. These high costs led the industry to shift from having many small waste dumps towards a smaller number of large landfills. This shift allowed firms to achieve greater economies of scale in their operations. The RCRA legislation has led to a continued decline in the supply of landfill space over the past two decades, from over 8000 in 1980 to approximately 2000 in 2015.

The legislation still impacts the industry to this day and has led firms to set up large landfills and haul waste over long distances using transfer stations. The limited supply of landfill space is a strong barrier to entry and firms wishing to build a new landfill face an uphill battle due to the large capital needed to excavate and operate them. Plans to open a new landfill will also be met with vigorous opposition from most communities and environmental groups. Firms that do not own or operate landfills must pay ‘tipping’ fees to gain access to one. Tipping fees can be substantial, consequently firms that have control of a landfills have a significant competitive advantage. The most successful firms in this industry are fully integrated; owning their collection services, transport stations and landfill space.

Other Revenue

The industry also earns revenue from recycling paper, plastic and aluminum and selling the recycled commodities, mostly to customers in Asia. Recycling is currently a small source of industry revenue. We do not expect this to increase significantly because recycling rates have slowed dramatically in the past decade and has essentially plateaued at 34% since 2010 this is despite the public focus on environmentalism and sustainability.

Another significant source of income for the industry is Energy & Petroleum waste. Firms in the industry earn income from the removal of the waste byproducts of oil and natural gas production. Revenue from E&P waste was a significant driver of earnings in recent years but has slowed significantly due to low prices which constrained drilling activity. The rig count chart below illustrates the precipitous fall off in drilling activity over the past year.
Waste Connections-Progressive Waste Solutions Merger

In January, 2016 WaCN and Progressive Waste Solutions (BIN) announced an all-stock, reverse merger transaction that would see Waste Connections shareholders receive 70 percent ownership of the combined company, and Progressive Waste shareholders receiving the remaining 30 percent. The new combined firm will trade as Waste Connections but will now be headquartered in Canada. This Merger is structured as an inversion and the combined firm will benefit from Canada’s lower tax rate. The deal would potentially reduce Waste Connection’s tax rate from 40% to 27%. The combination continues the trend of consolidation in the industry as firms continue to seek economies of scale and integration. The merger combined the 3rd and 4th largest players in the market. The combined firm would have annual revenues of approximately 4 Billion, however this is still dwarfed by the market leaders Waste Management and Republic Services that have annual sales of 14 and 8.8 billion respectively.

Low Oil Prices and E&P Waste

Between 2012 and 2014 E&P waste was a strong revenue driver for a number of firms, this lead to significant capital investment as firms sought to expand their presence in the market. In February 2015, Republic Services acquired Tervita LLC, an environmental waste solutions provider serving oil and natural gas producers in the United States. In the past year oil prices have fallen precipitously leading to a rapid decline in drilling activity and E&P waste production. Rig count, a strong indicator of drilling activity has decline 60% in the past year alone8. We expect drilling activity to remain low in the near to mid-term due to persistent oversupply in the oil market. This will constrain earnings from E&P waste and will negatively impact firms such as Waste Connections & Republic Services that are more exposed to the E&P space.

Low Inflation

Low inflation has limited industry revenue growth because approximately 40% to 50% of the industry’s revenues are earned from contracts tied to a CPI index. These contracts limit the power of the firms to increase prices above the inflation rate during the contract period. US inflation has been persistently low for the past 2 years, due in large part to low oil prices and the strong US dollar. In light of this low inflation environment industry players are seeking to have their contracts tied to the sewer index instead. Larger players have more bargaining power to negotiate for contracts not tied to CPI6. This is illustrated by fact that 40% Waste Management’s contracts are tied to CPI compared to 50% for Waste Connections. We expect inflation to remain low in the near term due to low oil prices and the strong US dollar. As contracts expire larger players will be able to re-negotiate better terms but smaller players will struggle to see price gains.

Low Commodity Prices

Firms in the industry process materials such as paper, plastics and aluminum and sell them as recyclable commodities to third parties primarily in Asia. Low commodity prices and slowing demand in China has led to a sustained decline in the price of these recyclable products. The falling price of oil has also made it cheaper to manufacture plastics from petroleum than to recycle plastic bottles. These developments have made recycling a loss center for most firms and many are shifting to new fee based contracts with municipalities in an effort to cut losses. Given China’s slowing demand and persistently low commodity prices we expect industry recycling revenues to shrink in the near term.

#11 PSI Recycling Grade Paper Price per Ton

![Source: SecondaryMaterialsPricing.com](image-url)
INDUSTRY TRENDS

Consolidation

Over the past two decades there has been a wave of consolidations and M&A activity within the industry as firms seek to gain economies of scale to counter the capital intensive nature of waste management. An additional key driver of the push towards consolidation is the increased pricing power achieved with scale. Larger firms are better able to negotiate favorable contracts with municipalities and large businesses. Despite the consolidation efforts the waste management industry remains fragmented with thousands of small to midsize medium players operating regionally. As waste volumes and per capita waste generation rates plateau, the industry has struggled to achieve organic growth and thus M&A has emerged as the primary growth strategy for firms. The EPA expects per capita waste residential volumes to decrease and as the USA shifts towards a more service based economy there will be less industrial waste generated. In light of the foregoing we expect that consolidation will continue to be the primary growth strategy in the industry. Larger players such as WCN, WM and RSG who have healthier balance sheets and more experience integrating acquisitions into their business will be able to grab a larger share of industry revenue.

Integration

There has been a strong industry push towards vertical integration as major players seek to control the collection, transport and disposal of waste in the markets in which they operate. Vertical integration allows firms to reduce supplier power, which is primarily in the form of tipping fees paid to dispose of waste at both transport stations and landfills. Ultimately, vertically integrated firms are able to capture more of the industry’s profits. The Management of large players such as Waste Connections have openly stated that they will rarely enter a new market if they cannot achieve waste integration. This trend has led major players to strategically acquire firms that own transport stations or landfills before they enter the new market. Given the slow top line industry growth we expect the trend of vertical integration to continue as firms seek to achieve economies of scale. Major players will also use vertical integration in tandem with M&A to squeeze smaller players out of the market.

Landfill Decline

The number of lands fills in the US has declined substantially over the last 3 decades, from over 8000 in 1988 to under 2000 in 2015. The reduction in the number of landfills was due in large part to the Resource Conservation and Recovery Act (RCRA) which mandated stringent and costly upkeep requirements for landfills. The increased cost of landfills pushed firms to seek economics of scale by making landfills larger so that they could spread their fixed cost over more waste volumes. The industry also shifted towards a larger network of transport stations that would channel waste over greater distances to a smaller number of landfills. Starting new landfills has also become more prohibitive; there are large excavation costs, strong opposition by communities and landfill approvals typically take over 5 years. The dynamics of landfill supply have given landfill owners more pricing power and firms that control their own landfills have a competitive advantage. In addition to the prohibitive costs to start new landfills, we expect landfill supply to continue to decline as firms develop more efficient ways to manage their current capacity. Larger players are also better leveraging their transport stations network to ship waste over larger distances instead of setting up landfills in closer proximity.

Privatization of Waste Collection

Approximately 25% of all municipalities collect and dispose of their own solid waste, this is down from 35% in 1995. This trend is expected to continue as municipalities struggle with tight budgets and studies have shown that privatized waste collections are cheaper.

MARKETS AND COMPETITION

The waste management industry is fragmented with thousands of small to mid-sized regional players. These SMEs compete aggressively on price because there isn’t strong demand for differentiated waste services. This price competition is exacerbated by the fact that municipal contracts dominate the residential waste collection space and these contracts are primarily awarded to the lowest bidder. Municipal authorities essentially bargain collectively on behalf of residents and thus reduces the pricing power of industry players. This dynamic has led firms to increase their size through consolidation in an effort to increase their pricing power.
Supplier power in the industry is moderately strong, because there are many players who collect waste but a much smaller percentage actually own their own waste disposal and transport services. Companies that are only waste collectors must pay tipping fees to third parties. Consequently, fully integrated firms have a competitive advantage especially given the limited supply of landfill space and the capital intensive nature of setting up a transfer station network. The three major players have continued their aggressive push to vertically integrate in all their markets.

The firms in the industry have adapted to compete in different ways. The large players; Waste Management, Waste Connections and Republic services have avoided head to head and costly price competition by targeting non overlapping markets. Waste connections focuses on less crowded regional markets while Waste Management and Republic Services have targeted larger urban areas. Waste Management has developed a large network of transfer stations to transport waste out of these urban areas. The three largest players have a large footprint and are present in most states while the smaller regional players typically compete in narrow geographic areas. The common thread amongst the largest firms is a sustained push towards purchasing smaller competitors to achieve more scale and pricing power.

The waste management industry is very mature. Top line growth will be very slow and will primarily be driven by population increases. The industry is highly fragmented but larger players have more pricing power and thus take a larger share of industry profits. This industry is not attractive for new entrants due to the large capital requirements, regulatory burden, and incumbent benefits. Incumbents in this industry benefit from long term contracts with municipalities, most have an average length of 3 to 5 years. we do not anticipate disruption to this industry from the entry of new players, especially given the trend toward consolidation and the competitive advantages of being integrated.

The chief substitute for waste disposal is recycling. we do not anticipate that recycling will disrupt the market in the near to mid-term because recycling rates have essentially plateaued over the past 5 years despite increasing attention to environmental sustainability. Recycling has also become uneconomical due to lower commodity prices. Recycling could become a greater threat if regulation changes and states begin to mandate ‘zero waste’ laws as observed in Europe. Waste to energy plants are also a substitute for waste disposal however given the low cost of oil we do not anticipate a significant growth in waste to energy in the near to mid-term.

Peer Comparisons

![1 Year Stock Price Chart](image)

Source: Yahoo Finance

As previously discussed, the waste management industry is highly fragmented and regional in nature but there a small handful of large players that operate on a national scale, the three largest are: Waste Management Inc., Republic Services Inc. & Waste Connections.

![Segment Revenue](image)

Source: WCN, BIN, RSG & WM 10K

While all three firms operate nationally, Waste Connections focuses on smaller regional markets that are
less competitive while Waste Management and Republic Services have more exposure to larger urban areas. Despite lower revenues, Waste Connections has higher net profit margins than the larger rivals. This superior profit margin is due in large part to the improved pricing power that the firm achieves by focusing on rural or regional markets. Waste Management has the most transfer stations because they channel a significant amount of waste out of the urban markets in which they operate to landfills in more distant areas.

<table>
<thead>
<tr>
<th>Company</th>
<th>Total Debt/Capital</th>
<th>Total Debt/Equity</th>
<th>Current Ratio</th>
<th>EBIT/Interest Expense</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Connections</td>
<td>52.0%</td>
<td>108.3%</td>
<td>0.96</td>
<td>7.49x</td>
</tr>
<tr>
<td>Republic Services</td>
<td>49.3%</td>
<td>97.4%</td>
<td>0.67</td>
<td>4.21x</td>
</tr>
<tr>
<td>Waste Management Inc</td>
<td>62.7%</td>
<td>168.0%</td>
<td>0.93</td>
<td>5.56x</td>
</tr>
<tr>
<td>Progressive Waste Sol</td>
<td>57.9%</td>
<td>137.4%</td>
<td>0.92</td>
<td>3.71x</td>
</tr>
</tbody>
</table>

Source: WCN, BIN, RSG & WM 10K

All three firms have significant leverage and financial risk as illustrated by their liabilities to asset ratios. Firms in this industry are capital intensive and use leverage to fund their fixed assets as well as mergers and acquisition activities. Interest rates are expected to increase in the near to mid-term and with it borrowing cost, therefore firms that are highly levered may have difficulty accessing capital to fund their growth. Waste connections is the least levered of all the firms and would be in a better position to access capital needed to pursue a M&A strategy.

Waste Management’s exposure to urban areas is beneficial, because Urban areas are more populated and thus generate more solid waste and potential revenues. Millennials also tend to favor urban environments and there may be a significant population shift to these areas in the future. The potential drawback however is that crowded urban areas are more likely to be targeted for recycling or zero waste laws than are rural areas, this could reduce solid waste volumes in these areas. In the event that more stringent recycling laws are passed, waste management and republic would me more negatively impacted.

Organic top line growth in this industry has slowed significantly as per capita solid waste generation rates have plateaued over the 5 years. This has lead firms to pursue an acquisitions strategy for growth. These three large firms are better positioned to succeed in this space due in large part to being larger and having better access to capital markets than their peers. The management teams of these three largest firms are also more experienced in acquiring and integrating new companies than other players are. Each of these three firms typically completes between 5 and 15 acquisitions each year. All three firms have significant leverage and financial risk as illustrated by their liabilities to asset ratios. Firms in this industry are capital intensive and use leverage to fund their fixed assets as well as mergers and acquisition activities. Interest rates are expected to increase in the near to mid-term and with it borrowing cost, therefore firms that are highly levered may have difficulty accessing capital to fund their growth. Waste connections is the least levered of all the firms and would be in a better position to access capital needed to pursue a M&A strategy.

The outlook for both manufacturing and the industrials sector is negative in the near to mid-term, this coupled with stagnant residential solid waste growth, low inflation...
and higher interest rates means that many of the industry’s numerous small players struggle to compete with larger vertically integrated firms. A depressed stock market and lower valuations could see many attractively priced firms available for big players.

**ECONOMIC OUTLOOK**

**Real GDP**

![Graph showing MSW Generation Versus Real GDP (1960-2012)](image)

*Source: EPA*

GDP is a strong indicator of economic activity and more solid waste is generated when GDP growth is higher due to increased consumer spending and commercial activity in the economy. We anticipate that 2 year GDP growth will be a moderately low 2.8%. GDP growth above this level would spark more solid waste generation from commercial and construction activity.

**Manufacturing**

![Graph showing ISM Manufacturing: PMI Composite Index](image)

Solid waste generated by Industrial activity accounts for over a quarter of all waste generated and manufacturing activity is a strong indicator of industrial production. Manufacturing has slowed considerably bring the PMI composite index below 50. We anticipate that Industrial activity will remain low due in the near to midterm due to low commodity prices, slow global demand and the strong US dollar.

**Inflation**

US inflation rate has been persistently low over the last 3 years due in large part to the strong dollar and low oil prices. Low inflation hurts firms in the waste management industry because approximately half of all revenues are tied to CPI index thus limiting price increases. We anticipate that inflation will remain low, and we forecast a 2-year target rate of 1.7%, still below the Fed’s target rate. Larger firms with more bargaining power will be better able to negotiate better prices but smaller firms will suffer more from this persistently low inflation rate.

**Population Growth**

![Graph showing Annual Percent Change in Total Population: 2012 to 2060](image)
The US Census Bureau projects that the rate of population growth will slow over the next 50 years. Population growth has been a consistently strong driver of solid waste generation and will thus constrain the industry’s growth rate. **Interest Rates**

A sustained period of low interest rates has fueled industry consolidation over the past decade and most larger players have used debt to fuel their M&A growth. We expect 10 year yields to increase by 111 basis points within two years. If economic conditions spur the fed to accelerate the rate increase, then we will see a reduction in M&A activity for the industry. This would reduce the consolidation trend that has served to reduce industry profitability over the past decade.

**CATALYSTS FOR GROWTH**

Privatization of municipal waste collection and macroeconomic factors will be the primary drivers of top line growth in this industry. Slowing population growth and a stagnant per capita solid waste generation for residential customers will make industrial and commercial waste more important to industry revenue growth. Increased manufacturing and higher oil prices will allow firms to earn additional revenue from specialty areas such as E&P waste. Continued consolidation will also allow firms to capture more of the industry profits.

**INVESTMENT POSITIVES**

- The industry is consolidating and the larger players are well positioned to continue to capture more of the industry’s future profits. These firms could represent an attractive buying opportunity.
- More municipalities are privatizing waste collection to save money.
- The trend of vertical integration is allowing firms to keep more of industry revenue.
- Landfills, fleet and waste transfer stations require massive capital outlay and have high fixed and operating costs. These serve as deterrents to new entrants.

**INVESTMENT NEGATIVES**

- Solid waste management is subject to stringent federal, state and local regulation and cost of compliance is high especially for firms that own landfills.
- US per capita solid municipal solid waste generation has plateaued since 2010.
- Low inflation expectations will limit near term revenue growth.
- The industry is highly fragmented with over 20,000 players who compete primarily on price.

**KEYS TO MONITOR**

The waste management industry is driven by municipal solid waste generation and disposal rates. Recycling and composting are key substitutes that will reduce solid waste disposal rates so it will prudent to monitor these forces. Recycling rates will be influenced by legislation such as ‘zero waste’ mandates and demand for recycled products will be influenced by commodity prices.

The waste management industry is subject to stringent legislation so it will be prudent to monitor how environmental legislation will impact how firms operate. More stringent regulations can significantly increase landfill operating cost which will have a ripple effect throughout the industry. Legislation such as land fill taxes that are used to discourage landfill use and encourage recycling will reduce industry revenues.

Privatization of municipal waste management is potential area of growth, therefore trends in municipal divestment should be monitored closely.
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