



Analysis of Waste & Recyclable Materials Collection Arrangements

Minnesota Pollution Control Agency
Presented by Jeff Schneider
4-16-2009



Presentation Topics

- 1. Purpose of Study & Scope of Work
- 2. Types & Prevalence of “Systems”
- 3. System Cost / Rates Comparison
- 4. Impacts on Program Outcomes
- 5. Impacts on Roads
- 6. Greenhouse Gas & Fuel Consumption



Common Terminology

- Only Addressing Curbside Residential Collection Services
- “Open Collection” Systems – Household Chooses any City Licensed Hauler
- “Organized Collection” Systems – City or County Either Contracts w/ a Private Hauler or Collects w/ Municipal Trucks / Crews
- Sometimes Applied to MSW & Recycling Separately




1. Purpose of Study

- Develop “Quantifiable” Data Comparing Open & Organized MSW & Recyclables Collection Related to:
 - Economics, Rates / Costs
 - Impacts on the Environment
 - Efficiency & Effectiveness Program Outcomes
 - Related to MPCA Objectives for GHG & Energy Reductions



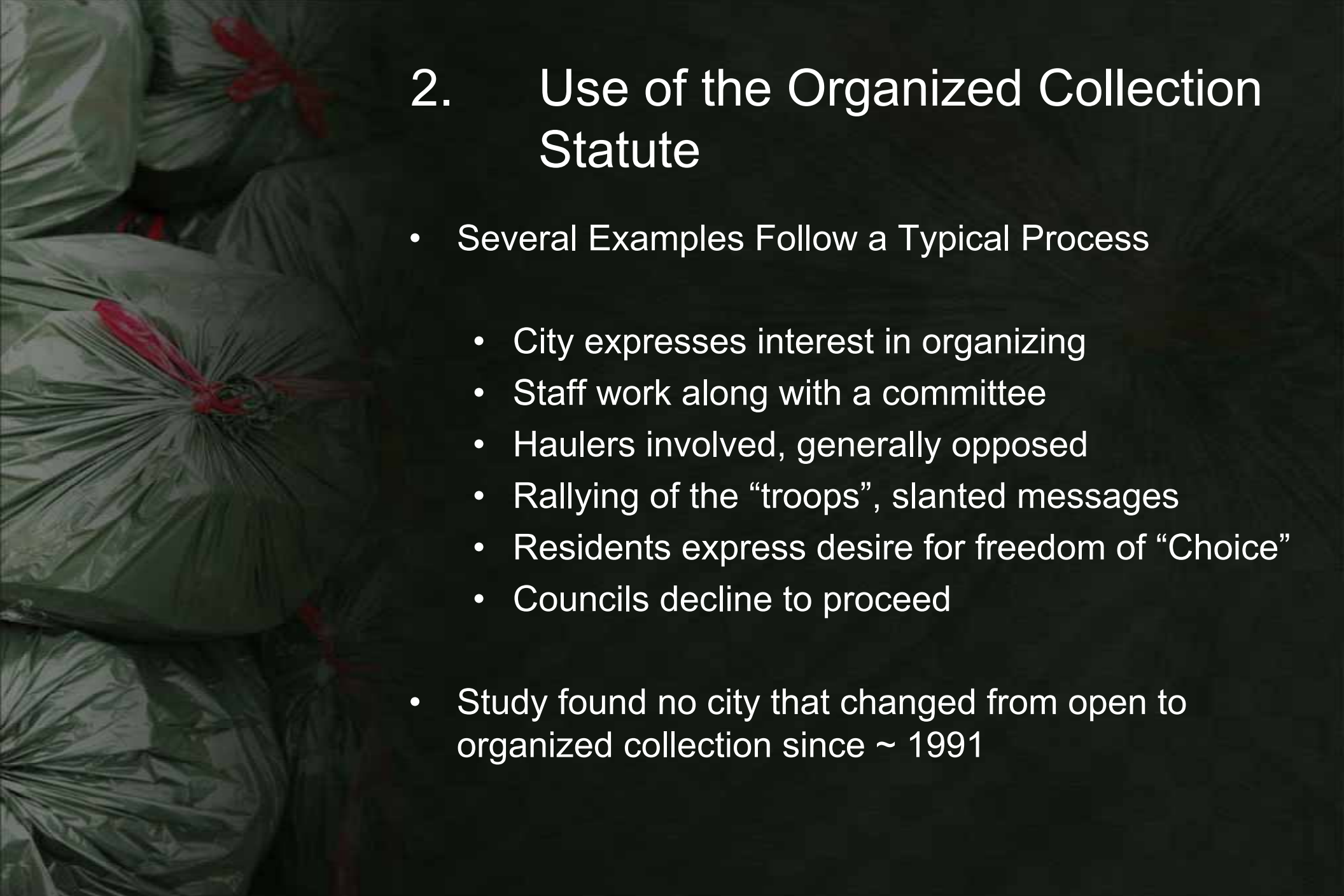
1. Scope of Work

- Literature Review & Analysis of Past Efforts to Organize Collection
- Survey of MN Cities with 10,000+ Population
- Comparison & In-Depth Analysis of 10 Select Cities – 5 Open Compared to 5 Organized
- Conclusions Related to Above
- Information Development Only –
 - No Recommendations or Policy Options



2. Prevalence of Collection Arrangements

- Open Collection is Prevalent in Minnesota
 - Statewide Estimate for Open Collection ~
 - 65% to 80% have Open MSW
 - 40% to 50% have Open Recycling
- National Reports Suggest Organized is more Common Outside of Minnesota
 - Survey of Cities Est. ~ 72% Organized
 - Survey of 100 Largest Cities in US Found ~ 80% Organized



2. Use of the Organized Collection Statute

- Several Examples Follow a Typical Process
 - City expresses interest in organizing
 - Staff work along with a committee
 - Haulers involved, generally opposed
 - Rallying of the “troops”, slanted messages
 - Residents express desire for freedom of “Choice”
 - Councils decline to proceed
- Study found no city that changed from open to organized collection since ~ 1991



2. Typical Municipal Goals & Objectives

“City expresses interest in organizing” because...

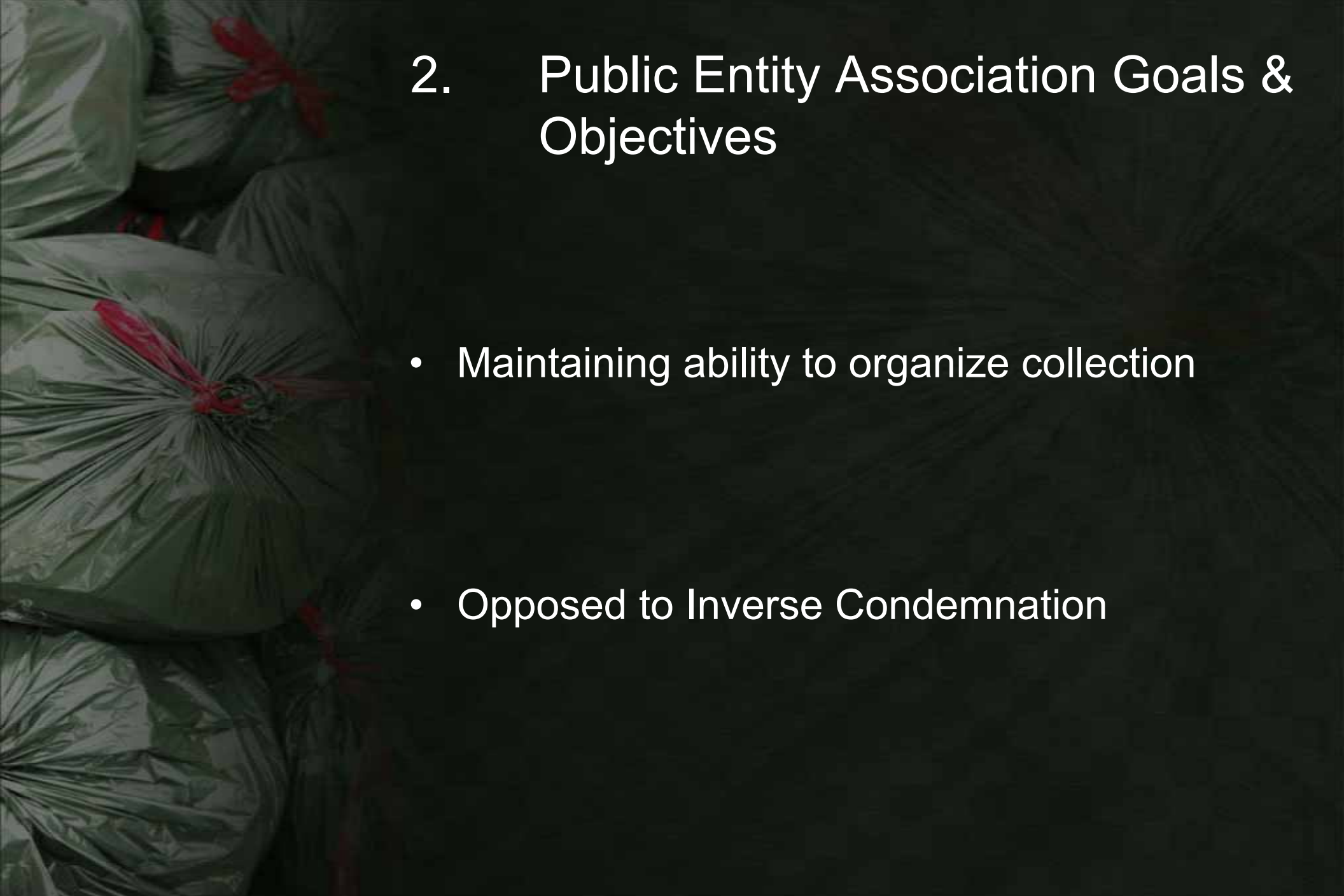
- Reduce Amount of Truck Traffic & Related Impacts
- Reduce Monthly Cost / Rates per Household
- Improve Program Outcomes & Standardize Services
- Improve Management of Waste According to SWM Plans & Hierarchy



2. Waste Hauler Goals & Objectives

Hauler Involvement, Rallying of the Troops...

- Haulers oppose organized collection to protect their business interests
- Favor free market – customer choice
- Risk loss of customers, limits growth, limits company value
- Raise issue of “Just Compensation/Inverse Condemnation”



2. Public Entity Association Goals & Objectives

- Maintaining ability to organize collection
- Opposed to Inverse Condemnation



3. Costs

- Cost Issues Addressed from Multiple Approaches
 - Literature Review for historical information
 - Municipal surveys/in-depth analysis with follow up billing surveys
 - Review of contracts
 - Review of websites



3. Costs

- While there are exceptions, and cost related issues can be complex –
- **Residents in Organized Collection Systems Can & Do Pay Less**



3. Costs

- Literature review found examples of surveys from organized collection studies
- Consistent conclusions by those cities is that organized cities show a lower cost across 30 to 60 to 90 gallon service

3. Historical Rate Survey Example

City	Type	30 Gal	60 Gal	90 Gal
Falcon Heights (average of 6 companies)	Open	\$13.59	\$15.56	\$17.17
Roseville (average of 7 companies)	Open	\$12.85	\$14.90	\$16.84
Maplewood (average of 9 haulers)	Open	\$12.19	\$14.11	\$16.08
North St. Paul, 2003	Organized	\$8.07	\$8.86	\$10.39
Shakopee, 2004-2005	Organized	\$8.60	\$10.65	\$12.24
Little Canada, 2002 (most recent rates listed)	Organized	\$8.29	\$9.77	\$11.29
White Bear Lake	Organized	\$7.50	\$11.00	\$15.00
Stillwater, 3 years ending 12/31/05	Organized	\$8.16	\$10.06	\$12.03



3. Literature Review Costs

- Similar results
 - Oakdale survey (2001)
 - 1993 Metro Area Study (GBB Report)
- Important to identify variables that affect rates
 - Service levels
 - Distances
 - Tipping fees
 - Taxes and surcharges
 - Impact of bulky waste costs



3. 2008 Municipal Rate Survey

- Rate information collected as part of survey included:
- Billing survey sought rate breakdown for:
 - Garbage service levels at 30 – 60 – 90 gallons
 - Taxes
 - Surcharges
 - Recycling
 - Yard Waste
 - Bulky Wastes



3. 2008 Municipal Rate Survey

- St Paul Public Works solicited participation
- Data also collected from:
 - Staff
 - Contracts
 - Websites
 - Follow-up discussions
- Discarded incomplete responses
- Totaled 156 responses entered
- Data limitations – not a “scientific survey”

3. Rates Varied for Same Hauler in Same City

MSW Hauler	30 Gallon	60 Gallon	90 Gallon
Eagan – Hauler A		\$16.98	
Hauler A	--	\$30.06	--
St. Paul – Hauler B	\$24.63		
Hauler B	\$29.80	--	--
St. Paul – Hauler C	\$36.99	\$47.76	\$39.08
Hauler C	\$22.87	\$48.32	\$29.75
Hauler C	\$21.50	\$18.29	--
Hauler C	\$43.25		
St. Paul – Hauler D	\$25.08	\$32.97	
Hauler D		\$9.60	--
Woodbury-Hauler E		\$13.92	\$21.18
Hauler E	--	\$18.12	\$25.22

3. Rates Paid to Same Hauler for 60 Gal. Service - Open & Organized

Open Cities	60 Gallon w/o taxes	Org. Cities	60 Gallon contract prices w/o taxes
Chanhassen	\$14.50	City A	\$11.40
Eagan	\$16.01	City B	\$9.04
Eagan	\$28.06	City C	\$5.56
St. Paul	\$30.80	City D	\$11.09
St. Paul	\$9.08	City E	\$15.07

3. Overall Survey – Average Monthly Rates Charged to Residents

Collection System	Average Monthly Rate		
	30 Gallon	60 Gallon	90 Gallon
Open MSW	\$22.64	\$25.46	\$25.46
Organized MSW	<u>\$14.83</u>	<u>\$16.98</u>	<u>\$22.23</u>
Difference	\$7.81	\$8.48	\$4.27
% Change	+53%	+50%	+19%

3. Average Monthly Service Rates Credited to Haulers

Collection System	Average Monthly Rate		
	30 Gallon	60 Gallon	90 Gallon
Open MSW without taxes	\$19.25	\$20.86	\$21.53
Organized MSW (contract prices)	<u>\$12.19</u>	<u>\$13.22</u>	<u>\$17.29</u>
Difference	\$7.06	\$7.64	\$4.24
% Change	+58%	+58%	+25%



3. Factors Affecting Rates

- There can be many variables included or not included in “Monthly Rates”
- One of most critical are charges for “extra services” such as bulky waste collection
- In some open systems, haulers choose not to charge for extra service to avoid causing the customer to change haulers




3. Factors Affecting Rates

- Some organized systems have rate schedules for extras that can be high
- Some organized systems manage the extra costs very well, controlling extra costs within the base rate

3. Example - City of Robbinsdale System

2008 Rate Schedule	Average Monthly Rate Paid to Contractor		
	30 Gallon	60 Gallon	90 Gallon
Organized MSW	\$7.09	\$8.52	\$9.94
Yard Waste	\$2.53	\$2.53	\$2.53
Recycling	<u>\$2.57</u>	<u>\$2.57</u>	<u>\$2.57</u>
TOTAL	\$12.19	\$13.62	\$15.04

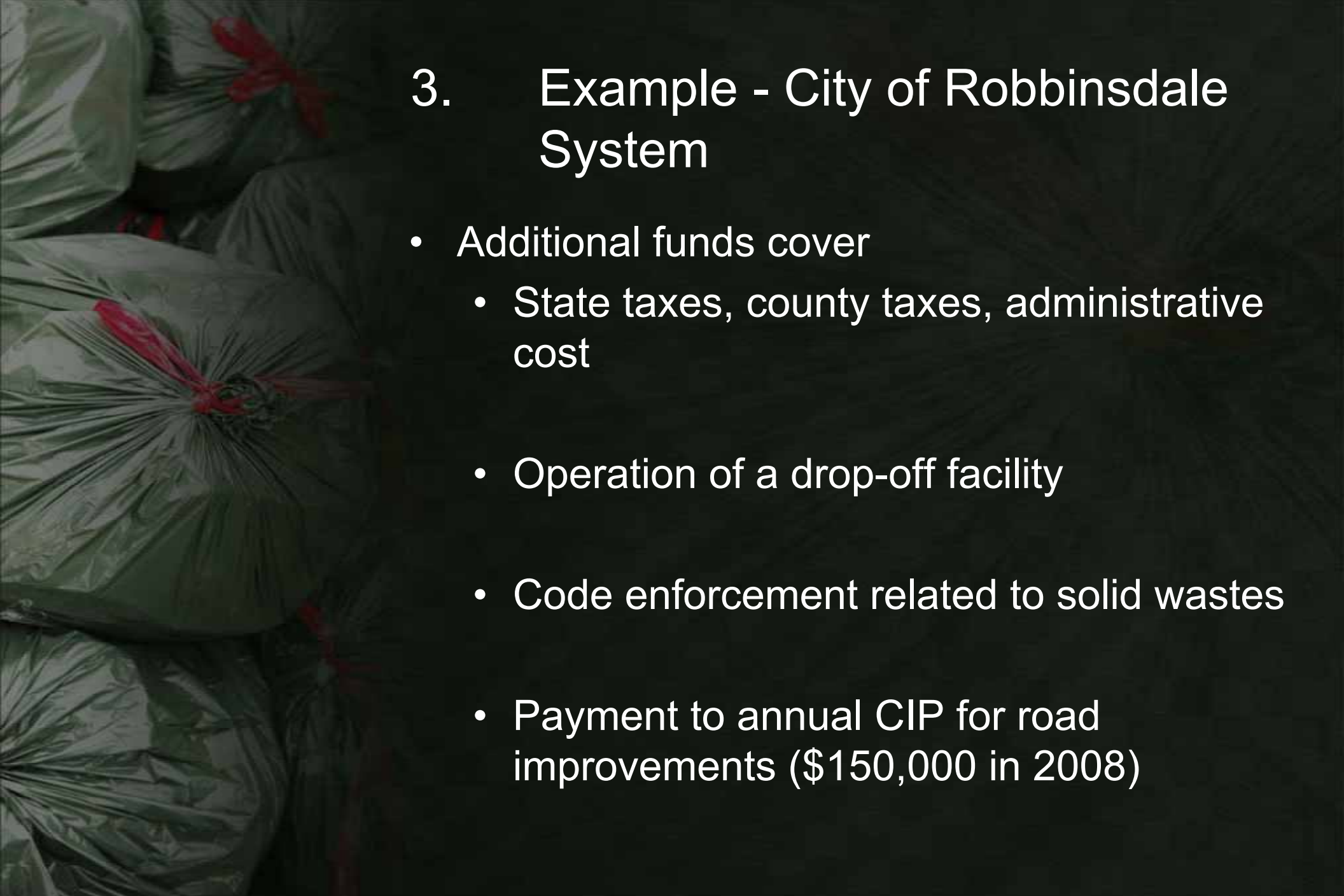


3. City of Robbinsdale Contract Service Scope of Services

- Weekly garbage collection
- Every other week recycling
- Unlimited yard waste collection April to November
- Dispose one Christmas tree
- Bulky waste collection (except for white goods)
- Hauler pays disposal costs
- “Free” service at 6 city facilities

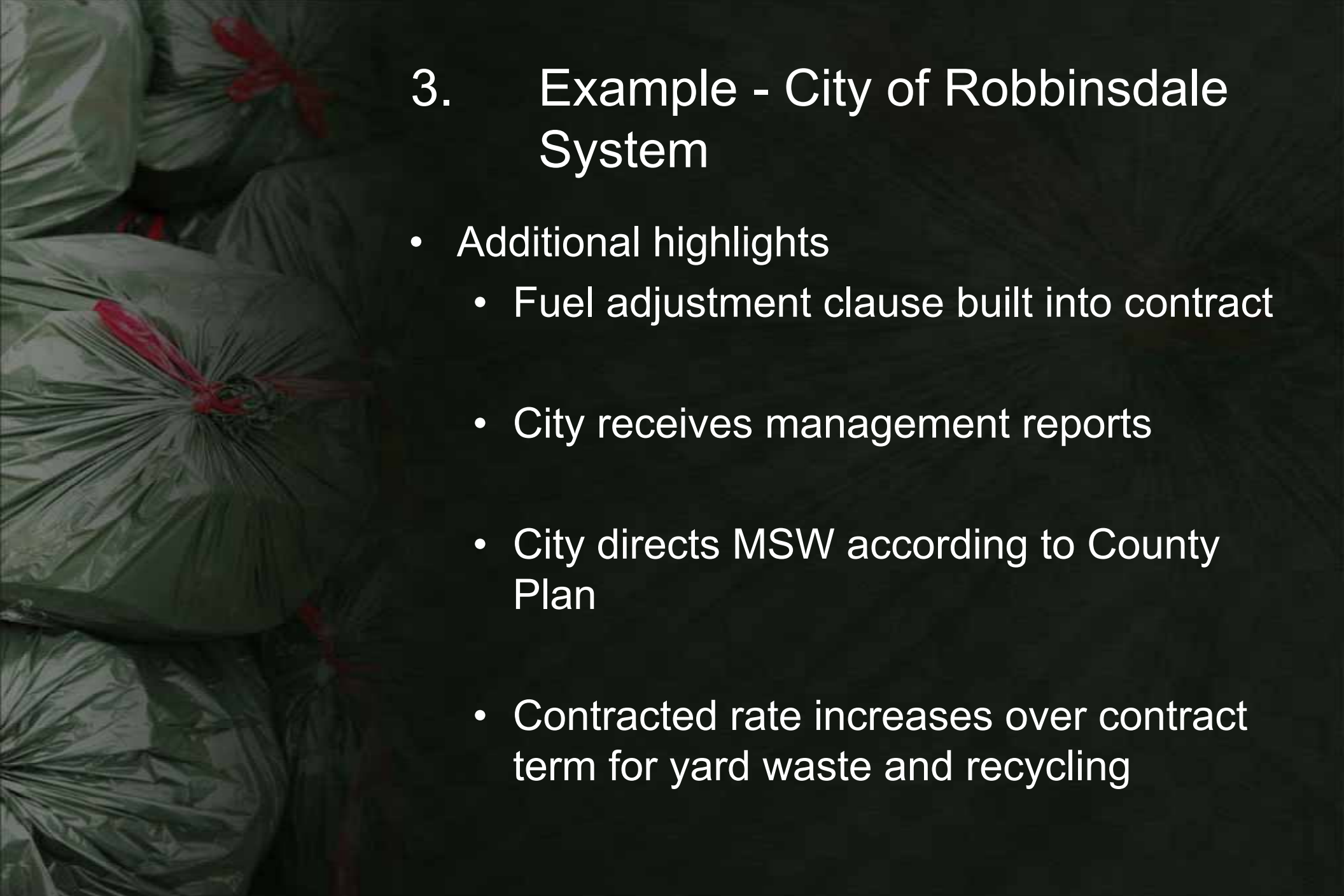
3. Example - City of Robbinsdale System

2008 Rate Schedule	City Billing vs Monthly Rate Paid to Contractor		
	30 Gallon	60 Gallon	90 Gallon
City Monthly Billing	\$19.19	\$21.81	\$24.61
Total Paid to Hauler	<u>\$12.19</u>	<u>\$13.62</u>	<u>\$15.04</u>
Difference	\$7.00	\$8.19	\$9.57



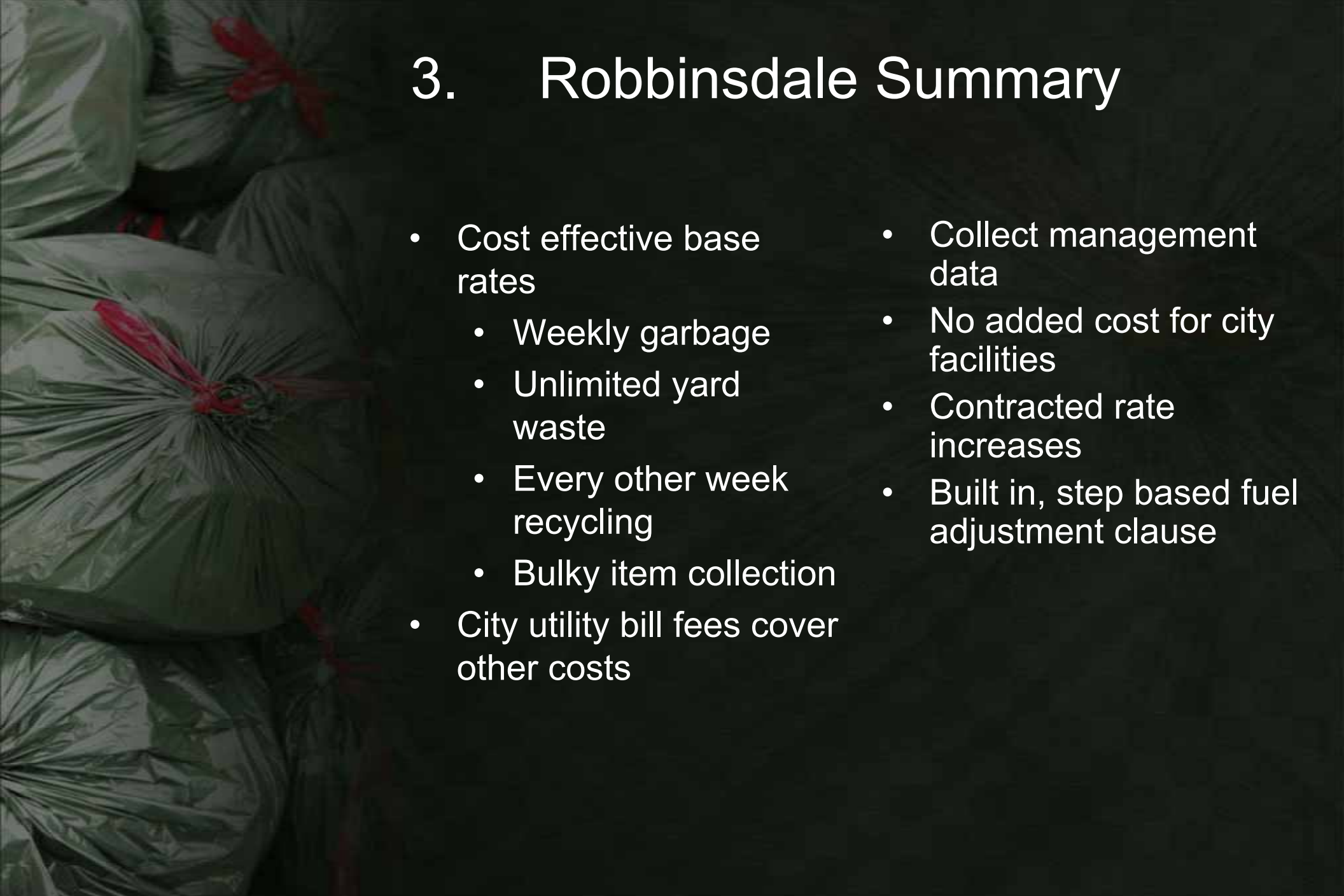
3. Example - City of Robbinsdale System

- Additional funds cover
 - State taxes, county taxes, administrative cost
 - Operation of a drop-off facility
 - Code enforcement related to solid wastes
 - Payment to annual CIP for road improvements (\$150,000 in 2008)



3. Example - City of Robbinsdale System

- Additional highlights
 - Fuel adjustment clause built into contract
 - City receives management reports
 - City directs MSW according to County Plan
 - Contracted rate increases over contract term for yard waste and recycling



3. Robbinsdale Summary

- Cost effective base rates
 - Weekly garbage
 - Unlimited yard waste
 - Every other week recycling
 - Bulky item collection
- City utility bill fees cover other costs
- Collect management data
- No added cost for city facilities
- Contracted rate increases
- Built in, step based fuel adjustment clause



3. Fuel Cost Adjustments

- There was a wide range for fuel surcharges reported in open cities
- Where reported in open cities, the range was \$0.59 to \$6.02 per month.
- In organized cities, some contracts are “silent” on fuel adjustments. Hence, negotiable
- Some like Robbinsdale cover fuel escalation in the contract (in 2008, calculated to \$0.82 for 60 gallon service)



4. Organized Collection Impacts on Program Outcomes

- Analysis of SWMCB Re-TRAC™ data found an increase in recycling pounds per household in cities with organized recycling collection (95% significance)
- Open MSW/Open recycling = 510 pounds
- Open MSW/Org. recycling = 583 pounds
- Org. MSW/Org. recycling = 573 pounds
- Average for Org. recycling = 579 pounds



4. Organized Collection Impacts on Program Outcomes

- Using the 69 pounds per household difference applied to 41 open Re-TRAC™ cities yields:
 - Another ~ 11,000 tons of recyclables per year
 - Equivalent to ~ 32,000 metric tons less per year of CO_{2e}



5. Impact on Roads

- Commonly stated concern for municipalities with open systems
 - City engineers and/or public works directors
- Literature Review and follow-up did not find much documented, quantifiable data on actual residential streets in MN
- Relative impact is likely variable based on street type and relative amount of garbage truck traffic to other traffic



5. Impact on Roads

- Data available relating a garbage truck to other types of vehicles
 - Equivalent Single Axle Load (ESAL)
 - MnDOT uses a formula of one garbage truck equivalent to 1,000 car trips
- City of Falcon Heights attributed the impact of garbage trucks on roads as
 - High in alleys (~86% of impact due to garbage trucks)
 - Low in heavily traveled areas (~8% due to garbage trucks)



5. Impact on Roads

- Design loads of residential streets plays a factor
 - City of Arden Hills memo that while reducing the number of heavy trucks should be positive, there are environmental factors generally responsible for majority of pavement deterioration on City's 9 ton load designed streets



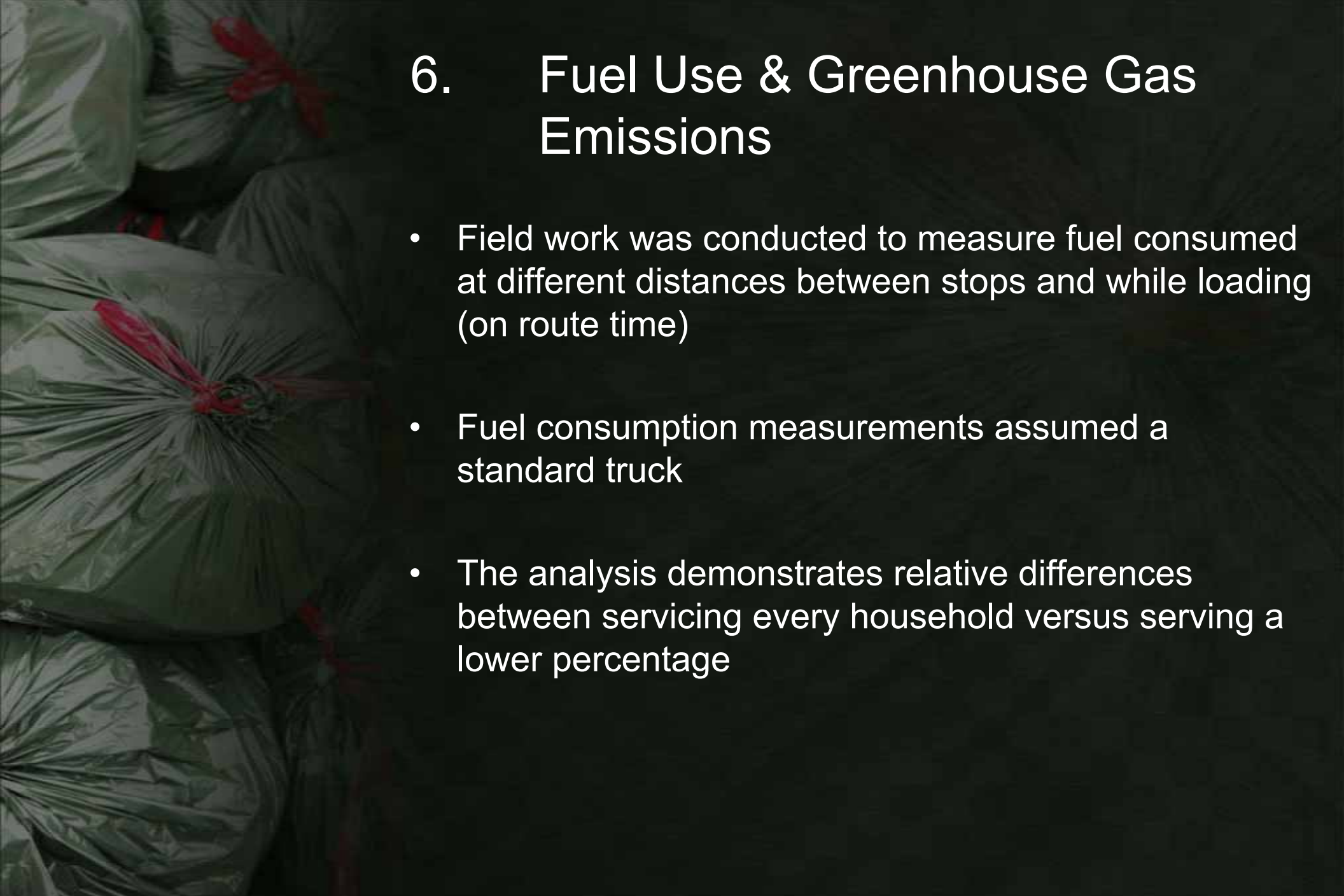
5. Impact on Roads

- Cost estimates of road impacts for cities
 - Open systems:
 - City of Roseville noted \$20 to \$40 per household per year from garbage trucks (\$188,000 to \$376,000)
 - City of Oakdale reported an estimate of \$120,000 to \$300,000 per year
 - Organized systems:
 - City of Robbinsdale set aside \$150,000 from solid waste fees for roads in 2008



6. Fuel Use & Greenhouse Gas Emissions

- Overview:
 - Open systems result in higher fuel use than a single hauler collecting every household
 - As the percentage of the households increases, there is greater efficiency, less drive-by time, lower relative fuel use, and less GHG per household



6. Fuel Use & Greenhouse Gas Emissions

- Field work was conducted to measure fuel consumed at different distances between stops and while loading (on route time)
- Fuel consumption measurements assumed a standard truck
- The analysis demonstrates relative differences between servicing every household versus serving a lower percentage



6. Developing Field Trial Data

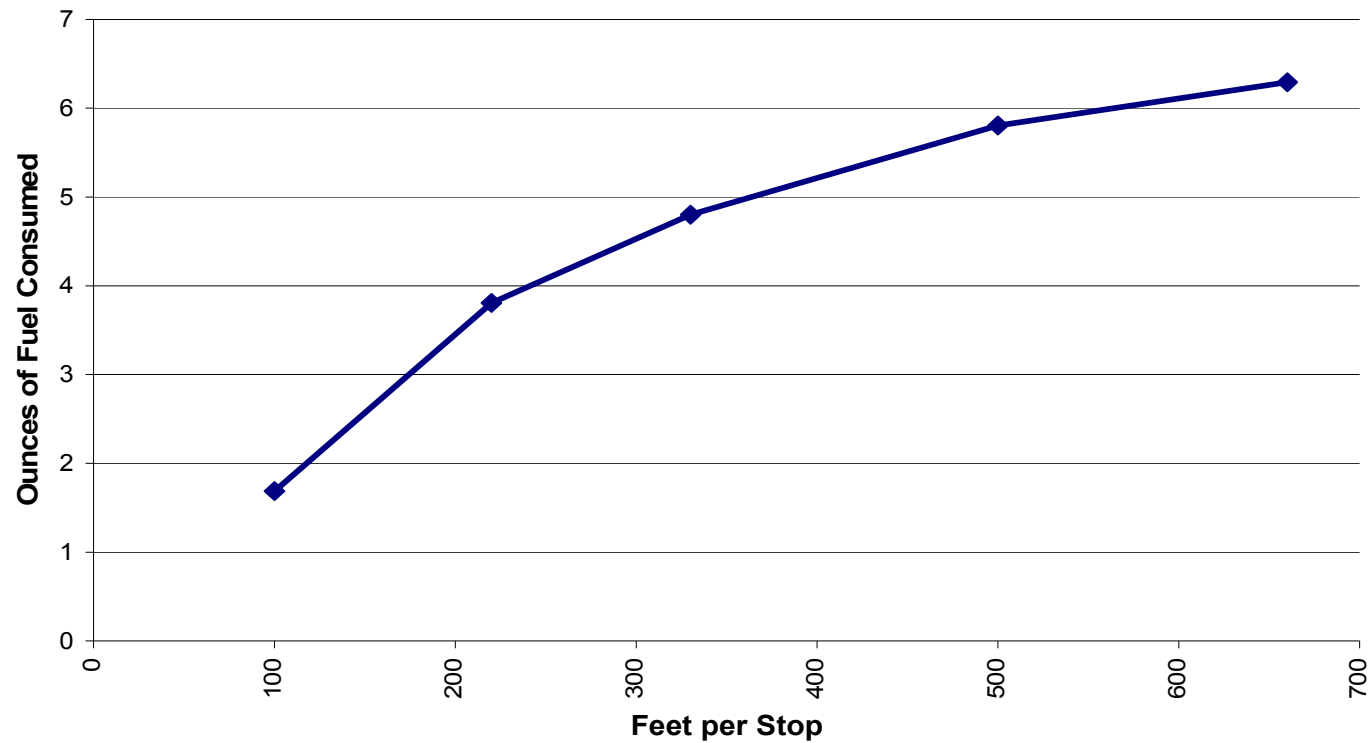
- Base line fuel use data was established by actual field test results
- A 20 cubic yard, tandem axle, packer truck was used to replicate field conditions and collect fuel consumption data
- Engine management data was collected for the different distances



6. Developing Field Trial Data

- Field fuel use measurements were collected for following distances in feet:
 - 100
 - 220
 - 330
 - 500
 - 600
 - Plus, idle time fuel use to replicate loading

6. Field Trial Fuel Consumption

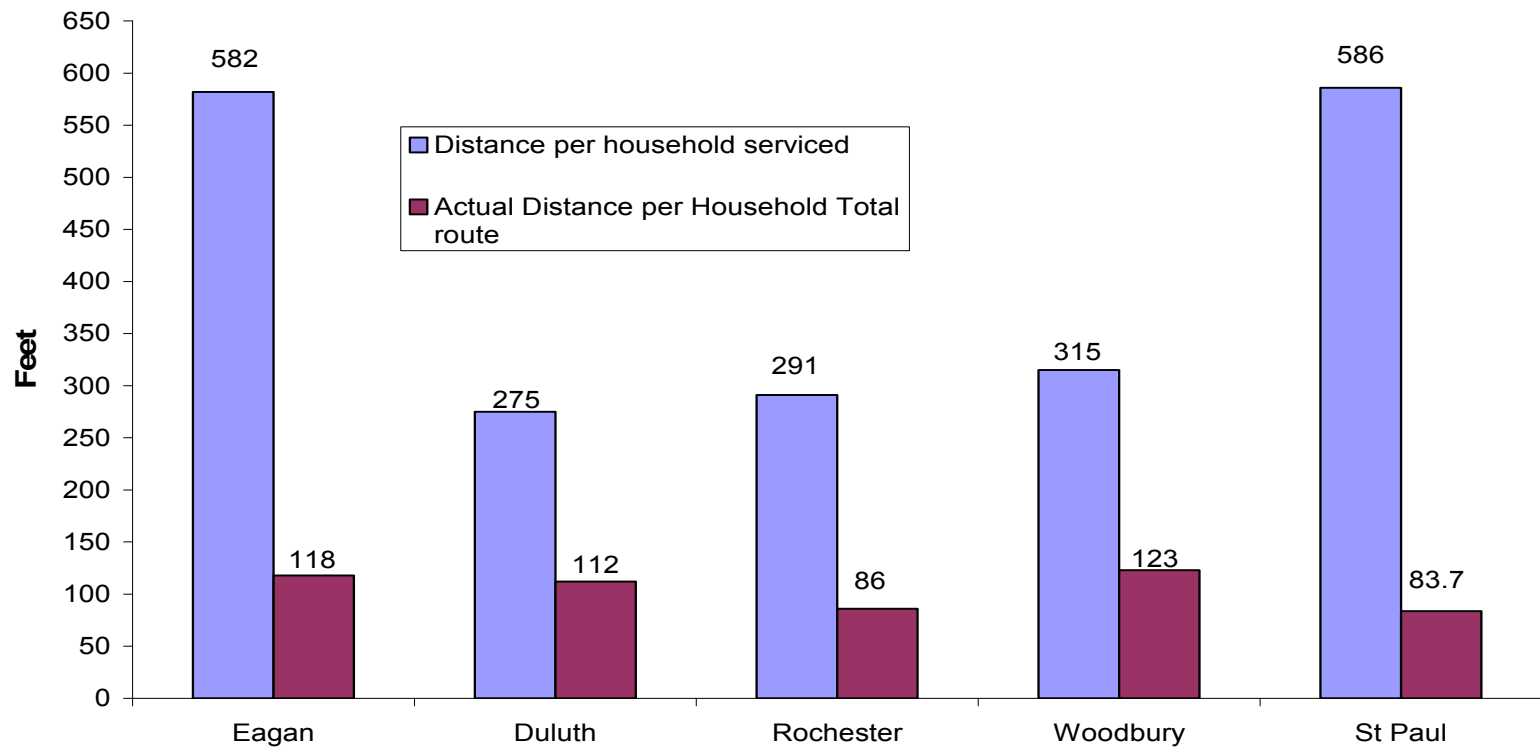




6. Field Observations

- Trucks were followed on sample routes in the in-depth cities
- Measurements included the average distance between all potential stops and the average distance between households actually serviced
- The key data is the average distance between all potential stops

6. Field Observations





6. Market Share Data

- Estimates of the market share for haulers operating in the five open cities in the in-depth analysis were developed
 - County hauler reporting data
 - Discussions with county or WLSSD staff of their knowledge combined with available data



6. Market Share Data

- Percentage of market share data leads to the estimated number of households
- Number of households served and average distance between all households provides the average distance between each hauler's stops

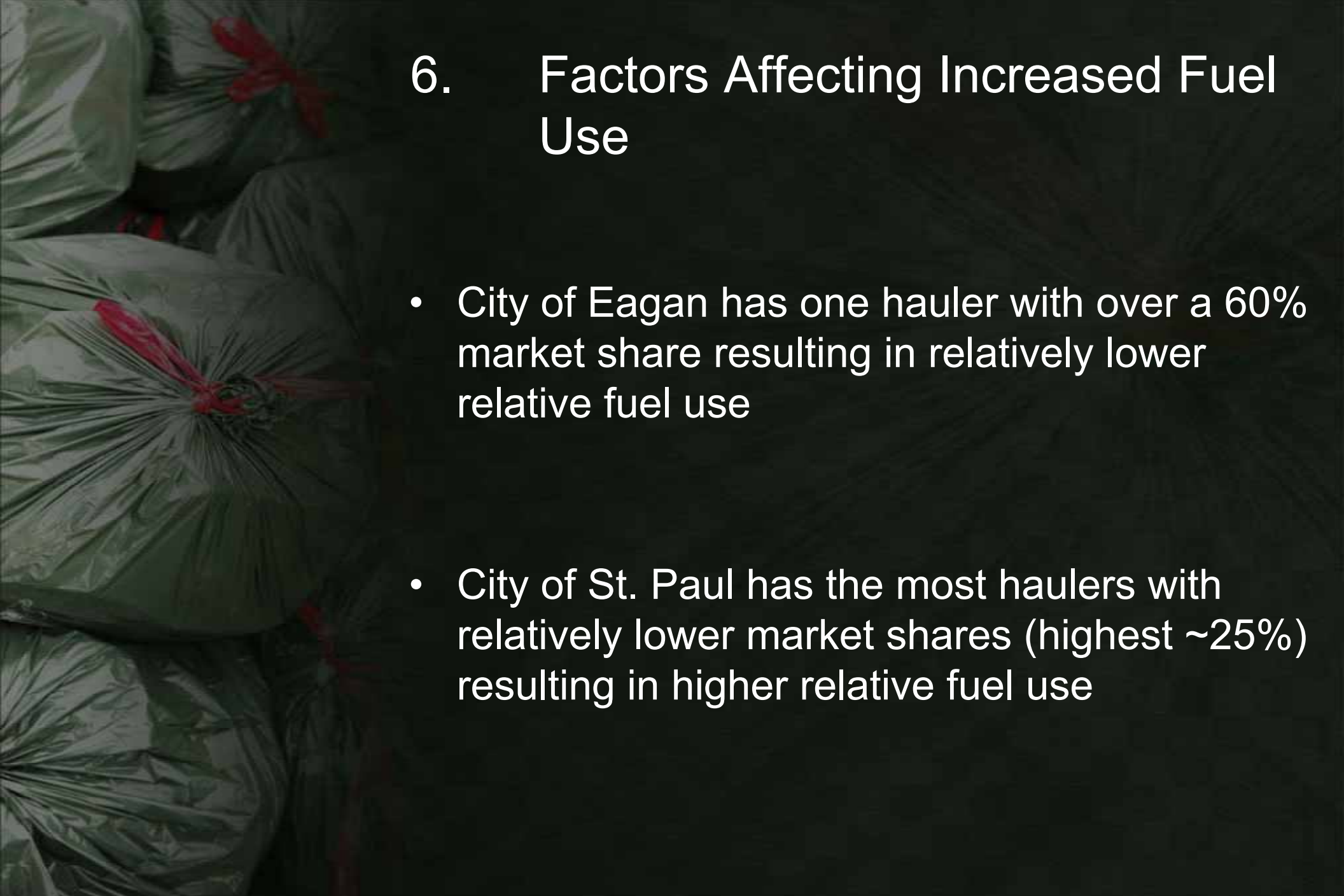


6. Market Share Data

- Haulers with market shares below 10% were grouped together as it is not likely these haulers drive the entire city residential area
- Fuel use calculations were completed for each of the five open cities for both MSW collection and recycling collection

6. Percentage of Increased Fuel Use

Increased Fuel Use – Existing System vs a Single Hauler for MSW					
% More Fuel	<u>City</u>				
	<u>Eagan</u>	<u>Duluth</u>	<u>Roch.</u>	<u>Wdbry.</u>	<u>St.Paul</u>
	216%	294%	250%	355%	437%



6. Factors Affecting Increased Fuel Use

- City of Eagan has one hauler with over a 60% market share resulting in relatively lower relative fuel use
- City of St. Paul has the most haulers with relatively lower market shares (highest ~25%) resulting in higher relative fuel use



6. Greenhouse Gas Differences

- Converting the increased fuel use to GHG provides the following for the five open cities:
- MSW = 2,347 metric tons of CO_{2e}
- Recycling = 998 metric tons of CO_{2e}
- Total = 3,345 metric tons of CO_{2e}



6. Greenhouse Gas Differences

- Calculating a difference on a household basis and applying it to the 30 municipal survey cities households with open systems provides an estimated additional 6,070 metric tons.
- Total estimate = 9,415 metric tons of CO_{2e}



Public Comment Being Sought Now!

- www.pca.state.mn.us
- Waste Collection Service Arrangements...
- Check it out!!!!
- Jeffrey Schneider
- 507-529-8830

