Indicators of Zero Waste Progress

SLI 16-1-A-1

Seattle Public Utilities

Addressing

- A description of SPU's zero waste (solid waste reduction) performance tracking methodologies
- How SPU separates economic effects from program effects

SLI Response Contents

I. Status of Action Items from Resolution 30990

II. Description of how existing programs are measured
   - *Residential Sector*
   - *Commercial Sector*
   - *Self Haul Sector*
   - *Waste Prevention*

III. Seattle Solid Waste Model Overview

IV. Recommendations

I. Status of Resolution 30990 Action Items

Action Items Summary

Completed Items

- Propose new actions with rates and budget proposals
- Report annually to Council in July
- All City agencies meet or exceed all requirements for waste reduction and recycling
- Consult with the Solid Waste Advisory Committee (SWAC)
- Collection trucks use cleaner fuels
- Performance based contracting for new collection contracts
- Increased opportunity for residential waste reduction and recycling audits
- Increase apartment/condo organics participation – propose incentives and education
- City transfer stations continue serving customers that haul their own solid waste

Action Items Summary

Completed Items, continued

- Implement transfer station rates at full cost recovery
- Study transfer station waste reduction and trip reduction.
- Modify DPD demolition permit to increase recycling
- Study strategies to deal with problem products
- Planning electronics take-back program
- Study items that could be discouraged by bans, taxes, other means – with recommendations
- 2008 Rate Study include range of zero waste programs

Action Items Summary

Items not done but on track

- Analyze how will reach 60% and 70%
- Expanded recycling at parks and large events
- Build commercial food waste composting participation, study incentives
- New stations design – assume customer disposal tonnage below 2007 levels
- Implement promotion of alternative services to customers hauling their own solid waste
- Support legislation to require manufacturers to take care of their products' disposal

Action Items Summary

Items with adjusted scope or schedule

- Upgrade North and South transfer stations
- Expand enforcement of current ban on disposal of recyclables
- Explore ways to inter-jurisdiction cooperation on waste reduction and product stewardship
- Analyze ban on disposal of food waste
- Pilot weekly compost collection and bi-weekly garbage collection
- Study mandatory apartment/condo food waste composting collection
- Construction & Demolition recycling strategies
- Increase support for Northwest Product Stewardship Council (NWPSC)

Action Items Summary

Items with problems
•Institute new community grant program •Market development for targeted difficult to recycle materials •Implement increased opportunity for commercial waste reduction and recycling education and audits

II. How Seattle's Recycling Programs Are Measured

Residential Sector Recycling

- Most residential recycling occurs via city recycling and compost collection contracts and the data are very good
- Programs include
  - *Residential Recycling (e.g., paper, cans, bottles)*
  - *Single Family Food and Yard Waste Composting*
  - *Backyard Composting Programs*
  - *Residential Collection of Oil and Electronics*

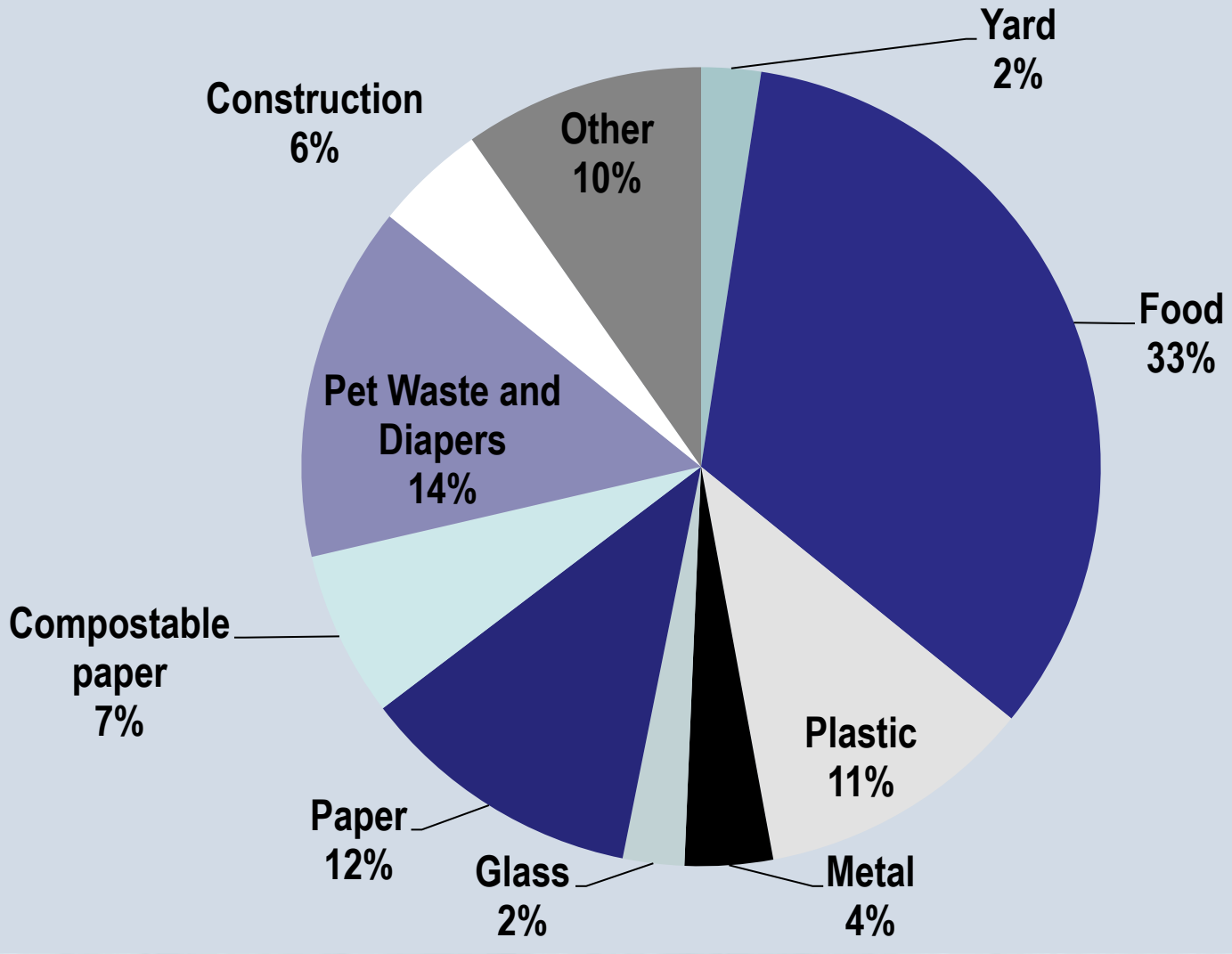
Residential Sector Recycling

- Measure as material is collected using truck scale weights for both recycling and garbage
- Allows us to calculate a recycling rate for each sector annually

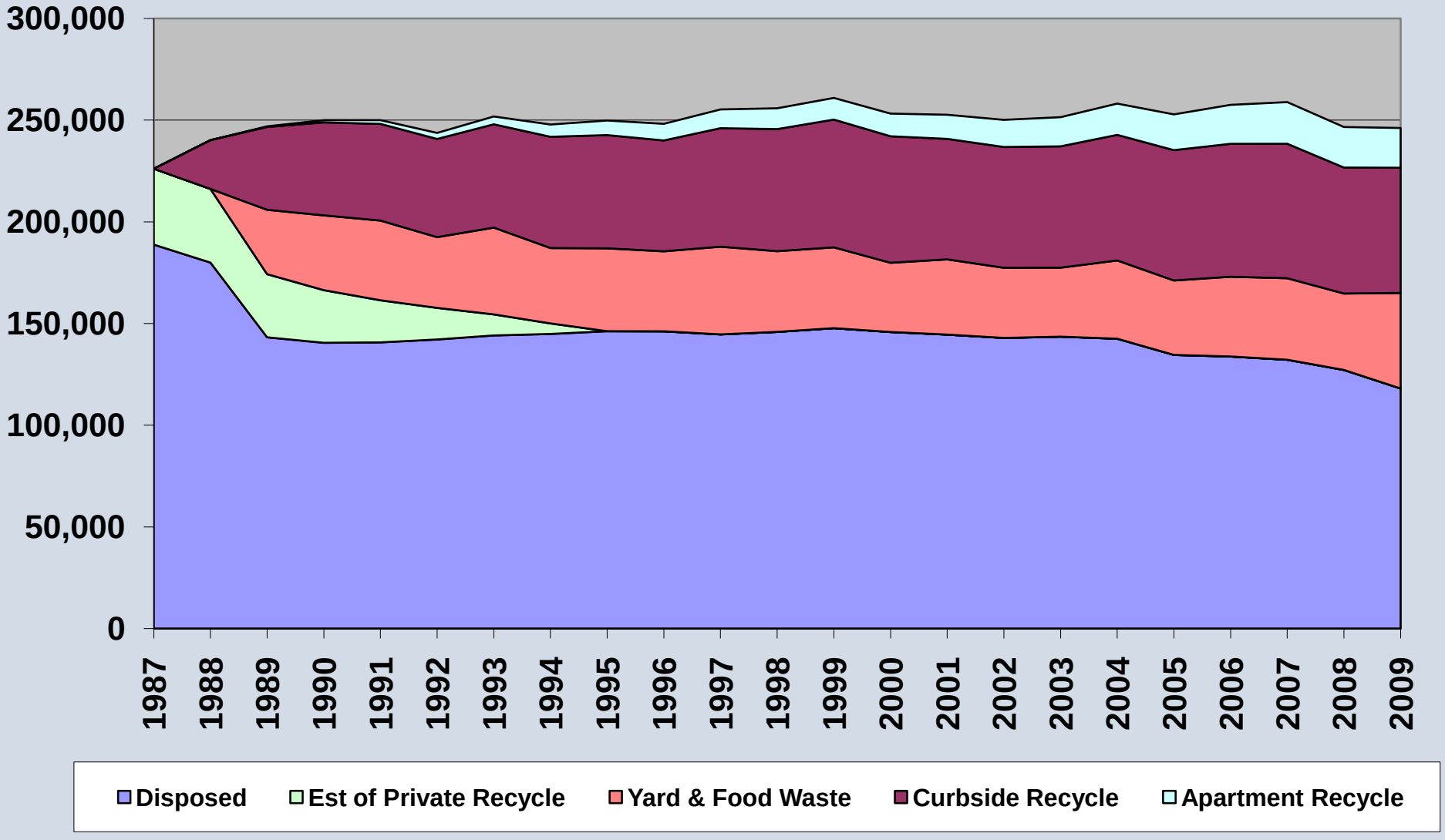
Residential Sector Recycling

- Every four years we do waste composition studies where we sample the waste and the recycling to determine it's exact composition
- This data allows us to calculate recovery rates for each material
  - *Recovery rate is the percent of a particular material that is recycled out of the total generated*
- Home Organics (composting) measured primarily with a survey every five years

Residential Waste Disposed 2006 Composition



Residential MSW Generation, Recycle, Disposed



* Includes an estimate private recycling tons, excludes backyard composting tonnages

Self Haul Sector Recycling

- Self haul sector: residences and businesses who bring material directly to city transfer stations in cars and trucks
- Self haul programs include
  - *Drop boxes for a variety of materials including mixed recycling, oil, metals*
  - *Yard waste composting*
  - *Private recycling*

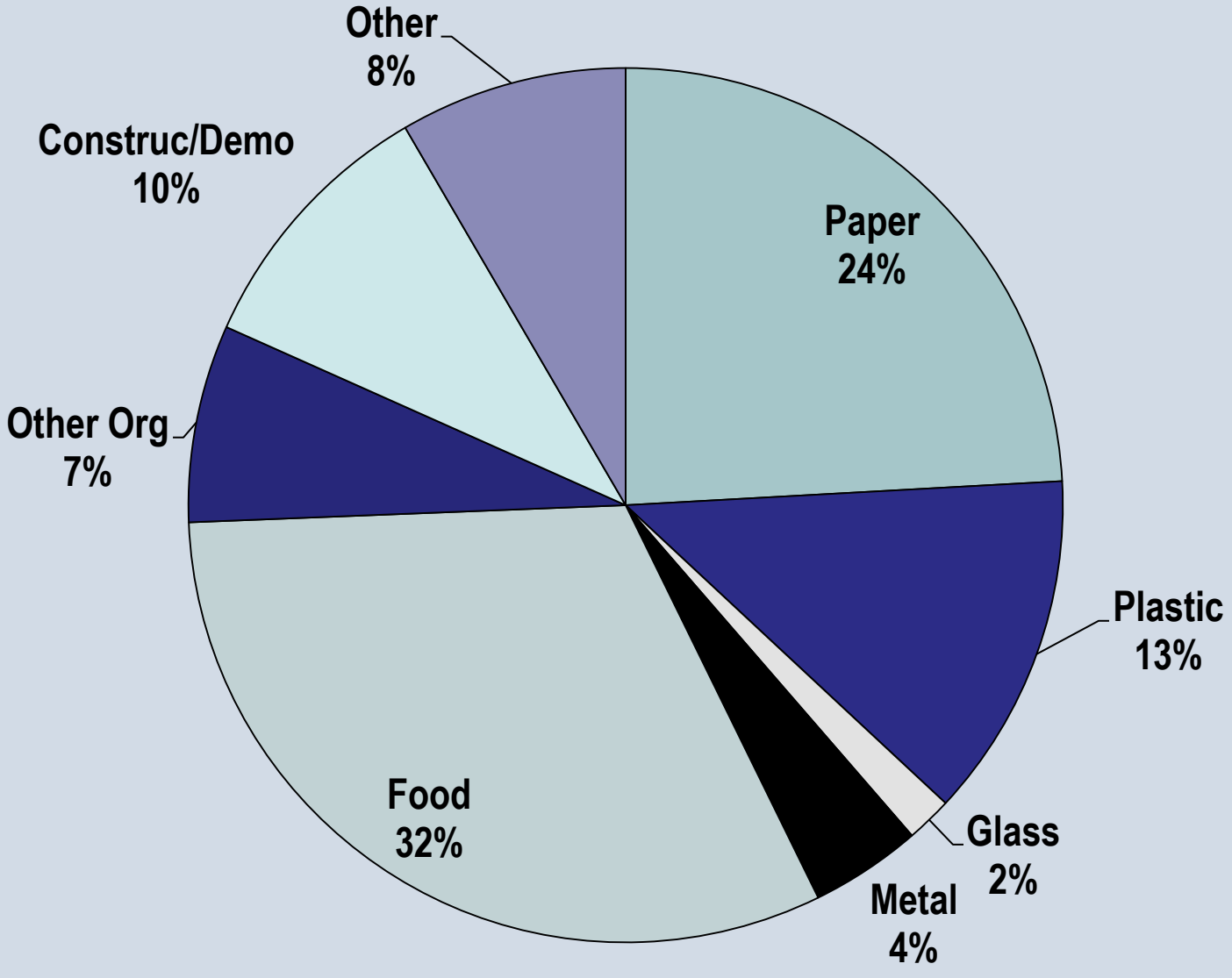
Commercial Sector Recycling

- Commercial sector includes material collected at businesses throughout the city
- “Programs” include
  - *Private recycling and composting*
  - *City contract composting program*
  - *City contract commercial cart recycling program*

Commercial Sector Recycling

- Most recycling in the commercial sector is not under city contract but happens in the private sector
- Private recycling measured through annual recycling reports
  - *Required from recyclers and processors operating in Seattle (Involves data scrubbing process to eliminate double counting)*
- City Contract organics and cart recycling
  - *Trips and tons from our collectors serving commercial accounts*

Commercial Waste Disposed 2008



Waste Prevention

- Programs active in all three sectors
- Difficult to measure tons not created and tons that don't enter the system
- SPU measures what we can when we can
  - *Self-weighing*
  - *Pre and post intervention surveys*
- Best to build evaluation into new programs

Waste Prevention

Examples of Waste Prevention Measurement

Program	Measurement Technique
Commissary Kitchens edible food waste reduction (Lean Path)	Based on food waste weight tracking reports from pilot kitchens – not extrapolated to additional sites
Edible food diversion food banks donation	Based on participant reporting
PaperCuts	Based on actual paper purchases/distribution by FFD and paperless billing SPU records
PHARM	Based on participant reporting (Bartell's, etc.)
Transfer Station Reuse	Reuse facilities' weight reports
Universities Reuse	Actual weights from program administrators
Community Grants	Grant recipient reports
City departments battery recycling, packaging, and reuse room	Based on reports (batteries shipped to RBRC, no handling by a WA reporting facility)
Carpet	From recycling reports to SPU
Take it Back Network	From recycling reports to Ecology
Residential deconstruction	Diversion rates reported by applicant based on weight receipts submitted to DPD
Residential house moving	Based on DPD permits
LEED diversion from disposal	Based on 3rd party certification, data sent to DPD
Built Green	Based on submittals to Green Building Program, data sent to DPD

Waste Prevention –
Green Building and Construction & Demolition Debris (C&D)

- The Green building programs divert tonnage from landfills from the smaller portion of C&D that enters the regular garbage system, as well as from the larger C&D waste stream.
- Larger C&D waste stream is not considered Municipal Solid Waste (MSW, in other words, regular garbage) and not included in 60% recycling goal.
- Later this year SPU will recommend a slate of C&D programs, including C&D recycling goals and measurement strategies.

III. SPU's Solid Waste Model

Sorting out economic effects from recycling program effects

SPU's Solid Waste Model

- Economic model estimated from historical data
- Uses historical data on waste tonnages and on factors theorized to affect tonnages
- Model has equations for each of the main sectors: residential, commercial and self haul
- Each equation has slightly different set of factors which also change over time as model is re-estimated

SPU's Solid Waste Model

- Examples of factors used in model include:
  - *Household income*
  - *Household size*
  - *Solid waste rates*
  - *Housing prices*
  - *Unemployment rate*
  - *Weather (temperature, rainfall, storm data)*

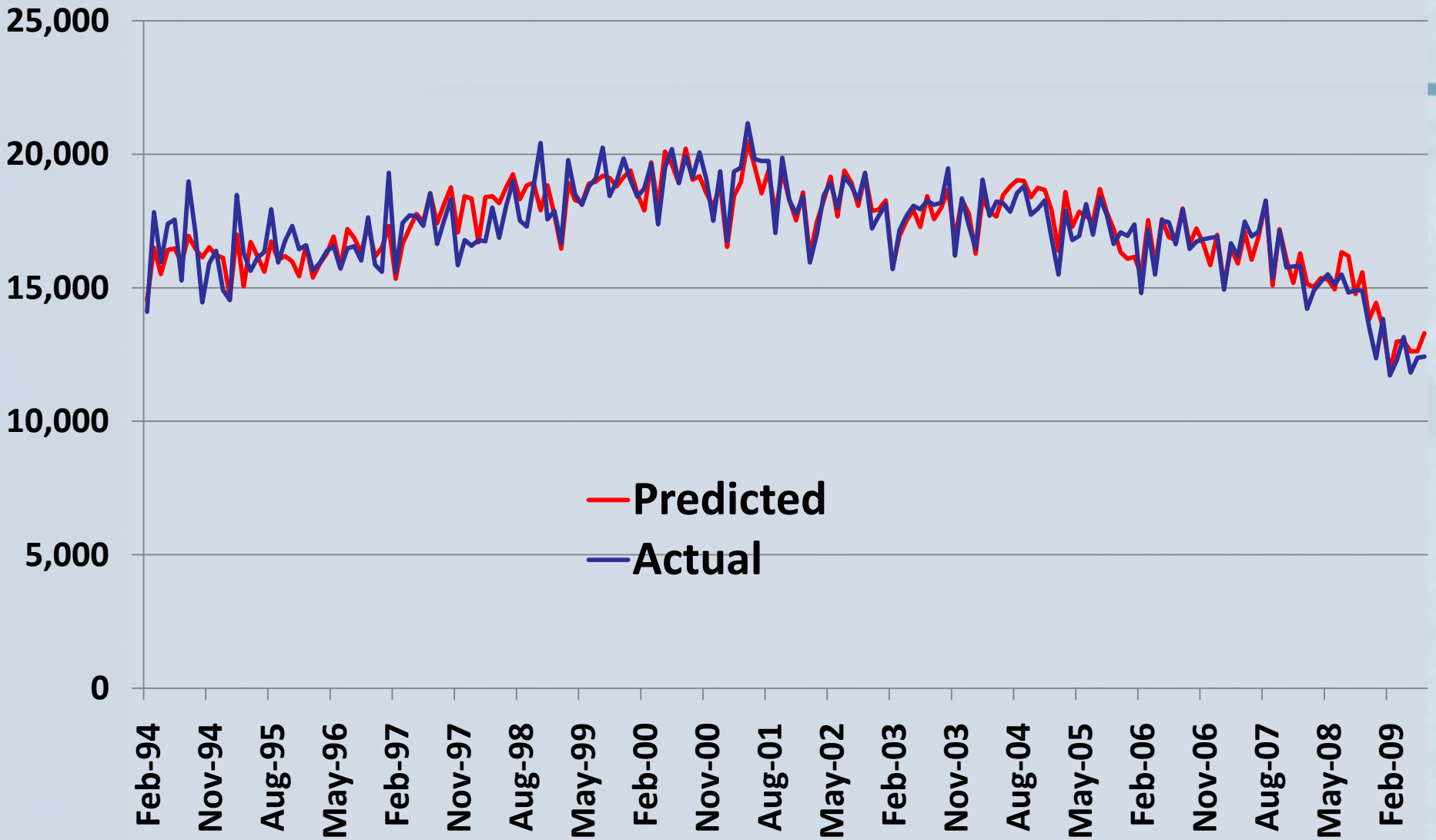
SPU's Solid Waste Model

- Model estimates relationship between the explanatory variables and the tonnages
- Model quality can be measured by how well model can predict garbage tons over the same period it was estimated
- Model quality also measured by how much of the variation in the tonnage can be explained by the explanatory factors

SPU's Solid Waste Model

- Commercial equation is pretty good
  - *90% "fit"*
  - *Estimated tons tracks actual experience pretty well*
- Variables in the current commercial equation include
  - *Unemployment rate*
  - *Sales tax revenue*
  - *Housing prices*
  - *Weather variables*
  - *Paper ban*

Commercial Garbage - Actual vs Predicted



SPU's Solid Waste Model

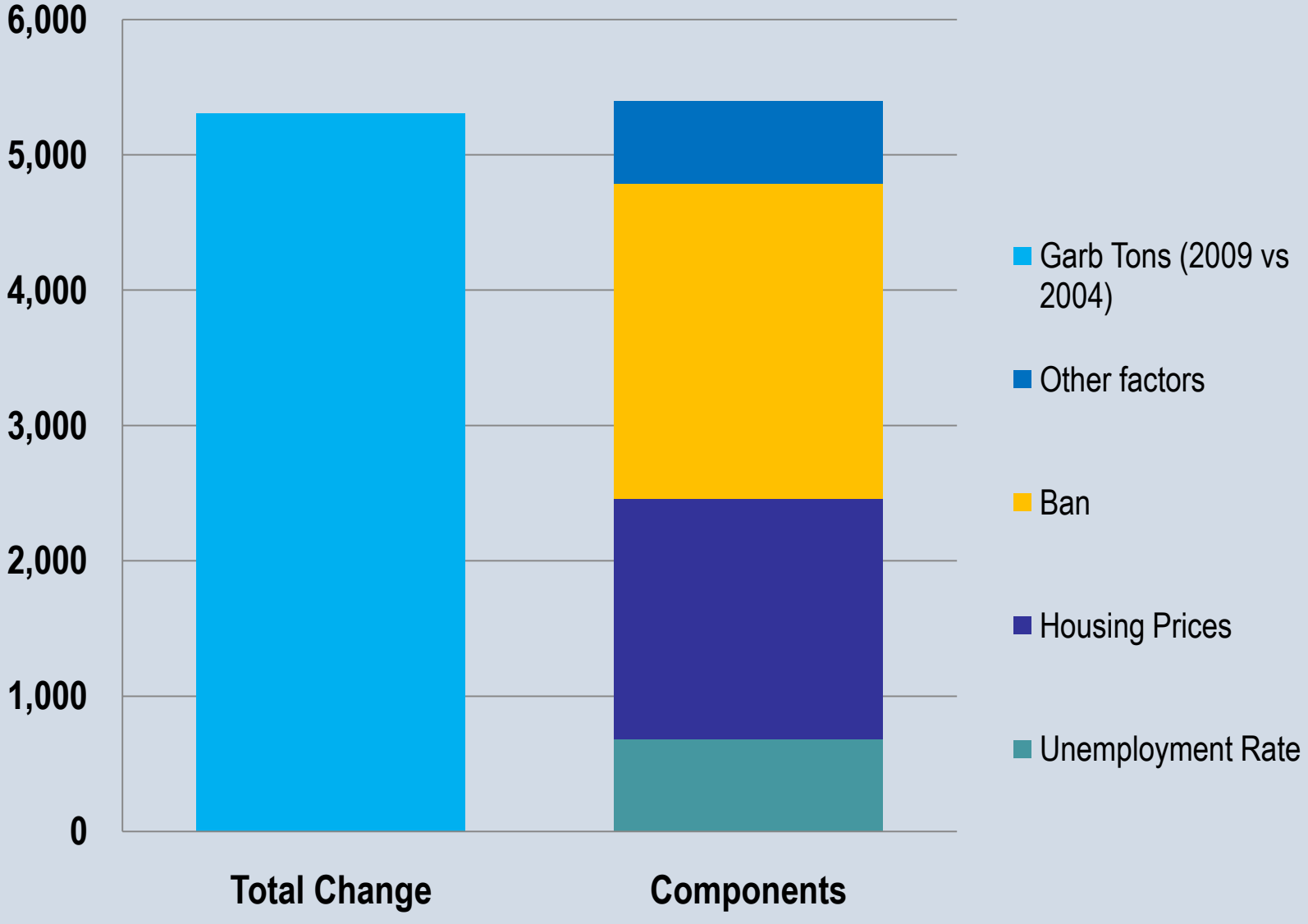
- Model can be used to evaluate recycling program performance (with some limitations)
- Model can be used to sort out the effects of factors such as the current recession from factors such as the implementation of new recycling programs.
- As an example of this, we will next look at the commercial sector equation

SPU's Solid Waste Model

example

- Commercial Sector ban on paper disposal began 2005
- Question is: What part of decline in tons is due to the ban versus other factors such as the recession?
- We used model to look at tons in 2004 (before ban) versus tons in 2009 and estimated what part of the decline could be attributed to the various explanatory factors

Components of the Drop in Avg Monthly Commercial Garbage Tons 2004 vs 2009



Meaurement Inventory by Sector

	Measurement Vehicle & Frequency						
Sector/Programs	Detailed tonnage data by truck trip or container	Quarterly Program Report	Annual Recycle License Report	Annual Summary	Home Organics Survey (every 5 years)	Waste Composition Study (every 4 years to check what is left)	5-8 Year Comprehensive Plan Evaluation and Recycling Potential Assessment
MSW Residential							
Backyard Organics (Yard, Food, Grasscycle)				annual number kept constant until 5 yr update	x	x	x
Curbside and Apartment Recycle	x	x		x		x	x
Curbside Organics	x	x		x		x	x
Curbside Oil	x	x		x		x	x
Curbside Electronics	x	x		x		x	x
Waste Reduction Programs				x		x	x
MSW Self Haul							
RDS Drop Boxes	x		x	x		x	x
Self Haul Organics	x	x	x	x		x	x
Waste Reduction Programs				x		x	x
MSW Commercial							
Commercial Organics (City Contract)	x	x		x		x	x
Commercial Private Recycling			x	x		x	x
Waste Reduction Programs				x		x	x
MSW Total Disposed Tonnage	x	x	x	x		x	x
C & D Programs							
Private Transfer Station Recycling & Disposal	x		x	x		x	x
Private Recycling Facilities			x	x			x
Deconstruction	x			x			x

IV. Recommendations

Recommendations

- Continue to collect described data with the existing reporting hierarchy
  - *Quarterly reports on program tons*
  - *Annual recycling report*
  - *Every 4 years composition studies*
  - *Every 5 years comprehensive plan, including recycling potential analysis*
- Continue to build evaluation into waste prevention programs
- Continue plans for including goals and measurement into new C&D programs

Questions?