Appendix B

ADJUSTMENT METHOD WORKING GROUP

Report to the Legislature–

A Comprehensive Analysis of the Integrated Waste Management Act Diversion Rate Measurement System

August 2, 2001

California Environmental Protection Agency
Integrated Waste Management Board

APPENDIX B

Table of Contents

MEETING 1 1

DIVERSION RATE ESTIMATE CAUTION SIGNALS 1
ADJUSTMENT METHOD Q&A (WAB STAFF TUTORIAL) 3
ADJUSTMENT FACTOR SUPPLEMENTAL MATERIAL 6
WEB LINKS FOR THE ADJUSTMENT METHOD WORKING GROUP FIRST MEETING 7
WHY "MAXIMUM" & "MINIMUM" CALCULATED DIVERSION[1]? 10
ADJUSTMENT METHOD OVERVIEW 12

MEETING 2 24

HOW DO ALTERNATIVE EMPLOYMENT MEASURES AFFECT 1999 DIVERSION RATES? 24
HOW DOES BOE'S TAXABLE SALES DEFLATOR DIFFER FROM THE CPI? 29
IS IT FEASIBLE TO STATISTICALLY ANALYZE THE ADJUSTMENT METHOD? 32
SUBJECT: MARGIN OF ERROR FOR ADJUSTMENT METHODOLOGY ANNUAL GENERATION TONS 38
DO CIWMB ESTIMATES OF FOURTH QUARTER TAXABLE SALES ADD ERROR TO ADJUSTMENT METHOD ESTIMATES OF WASTE GENERATION (AND THE DIVERSION RATE)? 40
INTERACTIONS BETWEEN THE ADJUSTMENT METHOD, BASE-YEAR GENERATION, AND REPORT-YEAR DISPOSAL 44
1999 BOE ANNUAL REPORT TAXABLE SALES VS CIWMB TAXABLE SALES 58

MEETING 3 77

HOW DOES CHANGING THE WEIGHTING OF THE POPULATION FACTOR IN THE RESIDENTIAL PORTION OF THE ADJUSTMENT METHOD FORMULA AFFECT 1999 DIVERSION RATE ESTIMATES? 77
WHAT ECONOMIC ACTIVITY DOES TAXABLE SALES MISS? 83
SB 2202 ADJUSTMENT METHOD FACTOR RATING (PRELIMINARY EVALUATION) 89

RECOMMENDATIONS FORWARDED TO SYNTHESIS GROUP FROM ADJUSTMENT METHOD WORKING GROUP 100

RECOMMENDATIONS NOT FORWARDED TO THE SYNTHESIS GROUP FROM ADJUSTMENT METHOD WORKING GROUP 106

Adjustment Method Working Group

Meeting 1

DIVERSION RATE ESTIMATE CAUTION SIGNALS

1. How old is the Base-Year (B-Y) Generation amount?

The older the B-Y, the greater the odds of diversion rate estimate error. Older B-Ys are usually less accurate because 1990 was the first year that jurisdictions were required to think about their waste generation (disposal and diversion). Many studies allocated countywide disposal and diversion tonnage to each jurisdiction based on population. These allocations were often inaccurate. Many jurisdictions only counted disposal at the nearest landfill or within their county. Also, diversion tonnage data was difficult to obtain, and many jurisdictions overlooked major diversion sources. The older the B-Y, the greater the odds that even small inaccuracies in Adjustment Method input values will compound to result in significant diversion rate estimate error.

2. How small (measured by population) is the jurisdiction?

The smaller the jurisdiction, the greater the odds of diversion rate estimate error. Expressed as a percentage of report-year (R-Y) disposal, a 10-ton measurement error will have a much greater adverse impact on a small jurisdiction than a large jurisdiction. If this error happens during a week in a county where waste origin is surveyed at landfills only one week per quarter, then it will be magnified in the jurisdiction's quarterly disposal amount extrapolation. Also, the odds of a second error offsetting the first error during the same survey week are much lower for a small jurisdiction. A large jurisdiction may have a hundred trucks going to the landfill during a survey while a small jurisdiction may only have one. A missed truck, or an additional truck, would be an insignificant change for the large jurisdiction, but may result in either 0% or 200% of normal quarterly disposal for the small jurisdiction.

3. Were jurisdiction-specific, rather than countywide, measures of population, employment, and taxable sales used in the calculation?

The smaller the universe of measurement, the greater the odds of diversion rate estimate error. However, a jurisdiction-specific measure may still be more representative than countywide. Consider the size of the jurisdiction relative to the size of the county, the proximity of the jurisdiction to the population and economic center of the county, and waste generation differences between the jurisdiction and the county. A major R-Y event or change that occurs exclusively within the jurisdiction, or in a substantially distinct and remote area of the county, may suggest that one level of measurement is more representative than the other.

4. Were the % changes (B-Y to R-Y) in population, employment, and inflation-adjusted taxable sales significantly dissimilar?

The greater the imbalance, the greater the odds of diversion rate estimate error. If one of these factors has a % change that is greatly different from one or both of the others, then it is likely that the nature of the production of solid waste in the R-Y is greatly different than it was in the B-Y. In this case, the Adjustment Method formula for estimating R-Y waste generation may not work very well. For example, a huge R-Y % increase in population coupled with minimal R-Y % increase in employment and inflation-adjusted taxable sales could reflect the birth of a bedroom community full of commuters and a fundamental change in waste generation patterns. A second example is the City of Shafter's experience with a huge new asphalt plant. The City's R-Y disposal more than doubled. Previously, non-residential disposal was insignificant.

5. **Was there a major event or change in the R-Y that would significantly change R-Y waste generation, but not be reflected in measures of population, employment, or inflation-adjusted taxable sales? For example, was there a disaster, military base closure, large construction and/or demolition project, or large change in the industrial sector?**

If R-Y disposal is not corrected for significant quantities of disaster disposal, the greater the odds of diversion rate estimate error. If major R-Y events or changes such as those mentioned above are overlooked, the estimated diversion rate may be very misleading. A major one-time event such as the Olympics may not increase a jurisdiction's taxable sales as much as it increases waste disposal.

6. **Is the B-Y residential generation % unreasonable, i.e., substantially inconsistent with what would be expected given what is known about the jurisdiction's B-Y demographics and economy?**

When a jurisdiction corrects its B-Y generation amount, the B-Y residential generation % may also need correction. However, in most cases it takes an extreme change in B-Y residential generation % to significantly change the estimated R-Y diversion rate.

7. **Is the estimated R-Y diversion rate substantially inconsistent with what is known about R-Y diversion program activity?**

If the estimated diversion rate is high, the jurisdiction has no diversion programs, and the jurisdiction knows of no business or institutional diversion programs within its boundaries, the odds of diversion rate estimate error are high. At the other extreme, a low (or negative) diversion rate coupled with a plethora of diversion programs suggests substantial diversion rate estimate error.

ADJUSTMENT METHOD Q&A (WAB STAFF TUTORIAL)

1. What is the Adjustment Method?

A standard formula that estimates jurisdiction waste generation. The precursor to a diversion rate calculation, it consists of five successive calculations to find:

- Inflation Multiplier
- Corrected Report-Year Taxable Sales
- Non-Residential Adjustment Factor
- Residential Adjustment Factor
- Report-Year Waste Generation

[See Attachment A for the formula and a calculation example.]

2. Why do jurisdictions use it?

It is less costly than the alternative: measure both disposal and diversion.

3. How does it work?

Using reference year (base-year) waste generation tonnage, and published population and economic change measurements, it estimates waste generation in a measurement year (report-year).

4. What economic change measures does it use?

Population, employment, taxable sales, and the Consumer Price Index (CPI).

5. Why are population, employment, taxable sales, and the CPI used?

Because they best fit jurisdiction-requested criteria:

- When combined, correlate best to tons of waste generated
- Simple and easy to use
- No additional cost to get data
- Available at county-level for all jurisdictions
- Provide a minimum level of accuracy and uniformity for all jurisdictions

[See Attachment B, *Analysis of Field Testing Results of the 12-31-93 Testing Draft, Base-Year Adjustment Method User's Guide*, Eugene Tseng, UCLA Extension.]

6. What input values are used in the formula, and which are estimates?

- All ten input values used in the Adjustment Method formula are estimates:
- Base-Year Generation Amount
- Base-Year Residential Generation %
- Base-Year Population

- Report-Year Population
- Base-Year Employment
- Report-Year Employment
- Base-Year Taxable Sales
- Report-Year Taxable Sales
- Base-Year CPI
- Report-Year CPI

7. If all the input values are estimates, how can much weight be given to this Report-Year Waste Generation amount?
The Adjustment Method is the best formula we have for inexpensively estimating waste generation. It works well for most jurisdictions. When evaluating a diversion program, more weight should be given to diversion program implementation data, particularly with smaller jurisdictions.

8. What are the standard or "default" sources for the adjustment factors?

Population	–	Department of Finance
Employment	–	Employment Development Department
Taxable Sales	–	Board of Equalization & CIWMB
CPI	–	Department of Finance

Every year the Board reformats adjustment factor data from these sources and posts it on the CIWMB Web Site. Due to the Board of Equalization's extended publication dates, CIWMB adds preliminary 3rd Quarter data, and estimated 4th Quarter data, to 1st and 2nd Quarter taxable sales data.
[See Attachment C, CIWMB Default Adjustment Factors, City of Los Angeles.]

9. May a jurisdiction use adjustment factors from some other source?
Yes. The factors must:
- Be from a published, independent third-party source
- Use the same source for both the base-year and report-year
- Be approved by the Board

10. What's the measurement level?
CPI is measured at the regional or statewide level. The other three are measured at the jurisdiction or countywide level.

11. May a jurisdiction measure CPI at the jurisdiction or countywide level?
Yes, but the alternative CPI measure must be published by a scientifically reliable, third party source, and its use must be approved by the Board.

12. May a jurisdiction use different measurement levels for each factor?
Yes. For example, jurisdiction population may be used with countywide employment, jurisdiction taxable sales, and statewide CPI.

13. How many different combinations of <u>default</u> adjustment factors are possible for the same diversion rate calculation?
Eight. For most jurisdictions, there are two levels each for population, taxable sales, and CPI, plus one level for employment (2 x 2 x 2 x 1 = 8). Although unlikely, each combination may result in a different diversion rate.

14. How may a jurisdiction choose between different combinations of adjustment factors?

Higher diversion rates result from the largest percentage increase in population, employment and taxable sales, and the smallest percentage increase in the CPI.

The Board's Web Site automatically selects default adjustment factors that yield the highest and lowest diversion rates. Using one or more alternative (not on the Board's Web Site) adjustment factors may result in an even higher or lower diversion rate. Jurisdictions do not have to use adjustment factors that maximize or minimize the diversion rate.

15. Is the jurisdiction measurement level more accurate than countywide?
Generally speaking, no. There is a greater likelihood of measurement error at the jurisdiction level than at the countywide level.
[See Attachment D, *CIWMB AB 2494 Uniform Methodology Study: Statistical Documentation for the Selection of Adjustment Factors for the 12-31-93 Testing Draft, Base-Year Adjustment Method User's Guide*, pages 4-5, Daryl Metz, UCLA Extension.]

16. Are there situations where the Adjustment Method doesn't work well?
Yes. It is less sensitive to changes in some economic sectors and/or activities that have less impact on taxable sales, employment, and population. For example:

Disaster
Military Base Closure
Large Construction and/or Demolition Project
Large Change in Industrial Sector

17. Are there any other indicators that the Adjustment Method may not be working well?
Yes. The Adjustment Method does not work well if there is unequal percentage growth (from base-year to report-year) in population, employment, and inflation-adjusted taxable sales.

18. What can a jurisdiction do if the Adjustment Method isn't working well?

- Join a regional agency and use regional adjustment factors
- Do a generation-based diversion rate analysis (estimate both disposal and diversion tonnage, then divide diversion tonnage by the sum of disposal and diversion tonnage)
- Substitute more accurate local values for standard adjustment values

19. Does the Adjustment Method estimate residential waste generation the same way it estimates non-residential waste generation?
No. The base-year waste generation amount is separated into residential and non-residential amounts before population and economic change factors are used in the formula. While residential generation is strongly correlated with population, employment and inflation-adjusted taxable sales also have an impact. On the other hand, non-residential generation is strongly correlated with employment and inflation-adjusted taxable sales, but not population. In short, economic change has more impact on non-residential waste generation.

20. Does the Adjustment Method correct base-year generation or report-year disposal amount problems?
No. The Adjustment Method estimates report-year waste generation. It heavily depends on a reasonably accurate base-year generation amount. Subsequent diversion rate calculations heavily depend on this estimated report-year generation and on a reasonably accurate report-year disposal amount. Problems with base-year generation or report-year disposal amounts (the two most important values in a diversion rate calculation) must be separately resolved.

ADJUSTMENT FACTOR SUPPLEMENTAL MATERIAL

This section consists of Internet material from various State and Federal sources. Please see the attachment, "Web links for the Adjustment Method Working Group First Meeting", for web addresses.

Population

California State Department of Finance – Historical City/County Population Estimates, 1991-1998, with 1990 Census Counts
U.S. Census Bureau – Population Estimates: Concepts and Geography

U.S. Census Bureau - Residence Rules

Employment

California Employment Development Department, Labor Market Information – Methods for Labor Force Estimates

* Labor Market Information – Employment by Industry Method

* Labor Market Information – Employment by Industry Data Compared to Employment Data in Labor Force Statistics

* U.S. Department of Commerce - Bureau of Economic Analysis – Regional Accounts Data

CPI

California Department of Industrial Relations - Frequently Asked Questions (and Answers) Regarding the Consumer Price Index

(* -- Data sources for new and/or alternative adjustment method factors.)

WEB LINKS FOR THE ADJUSTMENT METHOD WORKING GROUP FIRST MEETING

Background Information:

California Integrated Waste Management Site:

http://www.ciwmb.ca.gov/LGCentral/DivMeasure/AdjMetFc.htm
http://www.ciwmb.ca.gov/LGCentral/DivMeasure/AdjMeTxt.htm
http://www.ciwmb.ca.gov/LGCentral/Basics/AdjMthd.htm

Regulations

The California Code of Regulations (CCR), Article 9.1 Adjustment Method for Calculating Changes in Waste Generation Tonnage can be found here:

http://www.ciwmb.ca.gov/Regulations/Title14/ch9a9.htm#ch9ea9_1

Statutes

California Public Resource Code (40502):

http://www.leginfo.ca.gov/cgi-bin/displaycode?section=prc&group=40001-41000&file=40500-40511

California Public Resource Code (41780.1, 41780.2, 41781):

http://www.leginfo.ca.gov/cgi-bin/displaycode?section=prc&group=41001-42000&file=41780-41786

California Public Resource Code (41821):

http://www.leginfo.ca.gov/cgi-bin/displaycode?section=prc&group=41001-42000&file=41820-41822

Adjustment Method Factors

Population

California Department of Finance site:

http://www.dof.ca.gov/html/demograp/hist_e-4txt.htm

U.S. Census site:

http://www.census.gov/population/www/estimates/concepts.html
http://www.census.gov/population/www/censusdata/resid_rules.html

Employment

California Employment Development Department site:

http://www.calmis.cahwnet.gov/file/resource/indlfcomp.htm
http://www.calmis.cahwnet.gov/file/resource/indmeth.htm

Bureau of Economic Analysis.

http://www.bea.doc.gov/bea/regional/reis/ca34/

Taxable Sales

California Board of Equalization site:

http://www.boe.ca.gov/pdf/annrpt.pdf

CPI

California Department of Industrial Relations:

http://www.dir.ca.gov/dlsr/faqs.htm
http://www.dir.ca.gov/dlsr/CPIHistDataSerieseb.xls

WHY "MAXIMUM" & "MINIMUM" CALCULATED DIVERSION[1]?

The Board's approved method to calculate (estimate) a diversion rate uses eight input values to adjust a base-year waste generation amount forward to a report-year waste generation amount:

Base-Year Population	Report-Year Population
Base-Year Employment	Report-Year Employment
Base-Year Taxable Sales	Report-Year Taxable Sales
Base-Year CPI	Report-Year CPI

Each of these input values are estimates, and in most cases very good estimates. However, careful measurements almost always vary. The environment of every measurement is slightly different. If the combination of selected population, employment, taxable sales, and inflation measurements is lined up to move a diversion rate in the most positive direction, then the estimated diversion rate is "maximized". If the combination of these measurements is lined up to move a diversion rate in the most negative direction, then the estimated diversion rate is "minimized". Since it is not feasible to determine a jurisdiction's actual diversion rate, it has to be estimated, i.e., calculated approximately.

For population, employment, taxable sales, and inflation (CPI) estimates, jurisdictions have choices. First, the estimate may be a standard ("default") estimate provided by CIWMB, or it may be from a published, independent, third-party source. Second, the estimate may be measured at the jurisdiction or countywide level. However, because inflation estimates are generally not available at jurisdiction or countywide levels, nearly all inflation estimates are measured at the metropolitan area or statewide level. For Annual Reports to the Board, each jurisdiction is expected to select population, employment, taxable sales, and inflation estimates that most accurately reflect base-year to report-year percentage change in waste generation within their jurisdiction.

A jurisdiction may use one factor (for base-year and report-year) measured at the jurisdiction level, and another factor (for base-year and report-year) measured at the countywide level. For example, jurisdiction population may be used with countywide employment, jurisdiction taxable sales, and statewide CPI. If a jurisdiction decides to use only "default" estimates of population, employment, taxable sales, and inflation, it usually has eight possible combinations (2 x 1 x 2 x 2 = 8) of these input values:

Jurisdiction or Countywide Population
Countywide Employment[2]
Jurisdiction or Countywide Taxable Sales
Metropolitan Area or Statewide CPI

---

[1]See CIWMB's Web Page, Local Government Tools, Diversion Rate Measurement Calculation, Quick Calculation Results.

[2]Relevant jurisdiction-level employment data is readily available only for each decennial census year: 1990, 2000, 2010, etc.
For example, the City of Walnut Creek has eight possible combinations of "default" population, employment, taxable sales, and CPI values for 1998:

POPULATION	EMPLOYMENT	TAXABLE SALES	CPI	EST. DIVERSION RATE
J	C	C	M	55% (“minimized’)
J	C	C	S	55%
C	C	C	M	56%
C	C	C	S	56%
J	C	J	M	60%
J	C	J	S	61%
C	C	J	M	61%
C	C	J	S	61% (“maximized”)

Measurement Level

J = jurisdiction

C = countywide

M = metropolitan area
S = statewide

As illustrated above, the range of estimated diversion rates is usually narrow. The highest estimated diversion rate is “maximized”, and the lowest estimated diversion rate is “minimized”.

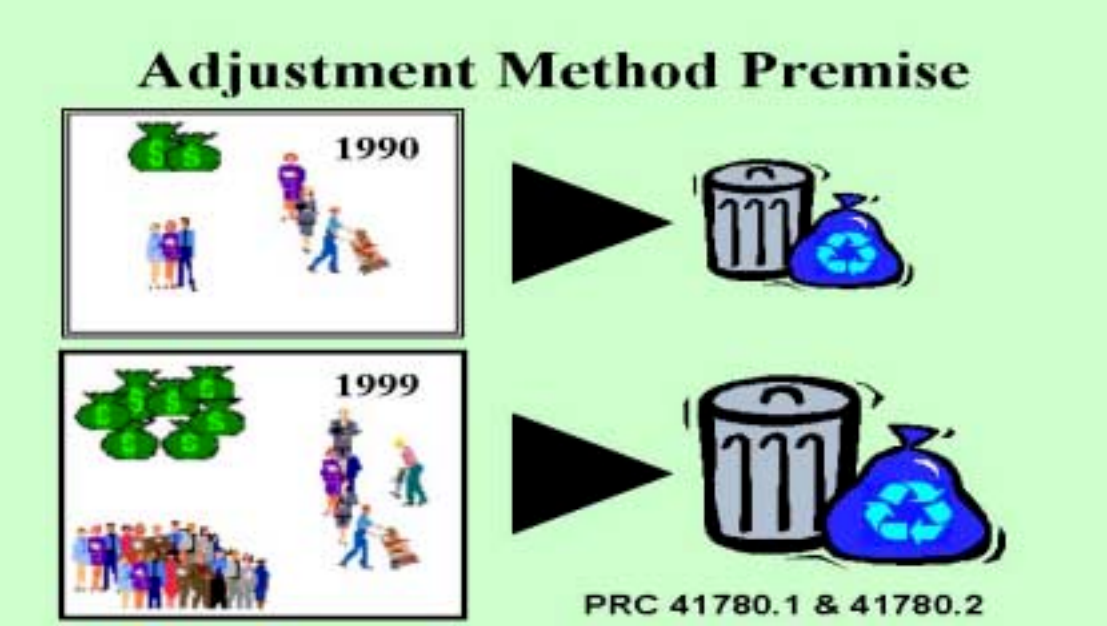
ADJUSTMENT METHOD OVERVIEW

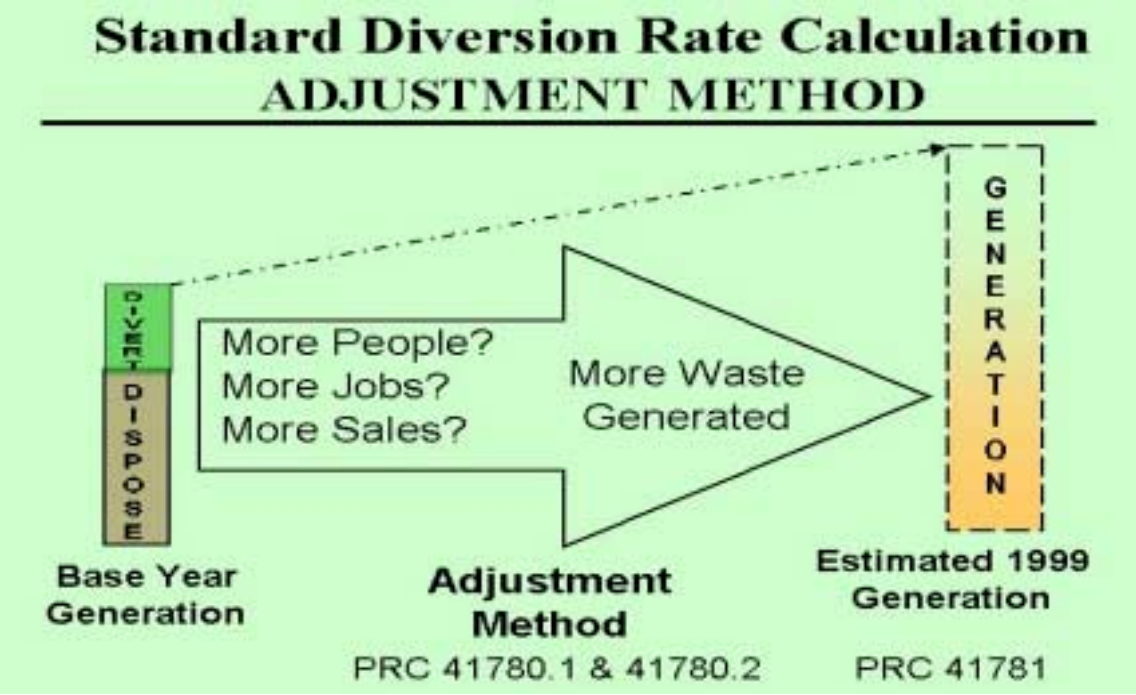
Base-Years
The Foundation for
Estimating Current Generation

PRC 41780.2 & 41781

Adjustment Method
Estimating Current Generation

PRC 41780.1 & 41780.2


Adjustment Method Premise
1990
1999
PRC 41780.1 & 41780.2


Standard Diversion Rate Calculation
ADJUSTMENT METHOD
DIVERT
DISPOSE
More People?
More Jobs?
More Sales?
More Waste Generated
GENERATION
Base Year Generation
Adjustment Method
PRC 41780.1 & 41780.2
Estimated 1999 Generation
PRC 41781

Adjustment Method Development

- Do not penalize jurisdictions for changes in economy, population, and other factors like disasters
- Board adopted method developed by working group of interested parties
- First time this method used to estimate waste generation

PRC 41780.1

Adjustment Method Factor Sources

- Uses readily available factor sources to keep costs down and maintain consistency:

- Population
  - –(CA Department of Finance)

- Employment
  - –(CA Employment Development Department)
- Taxable Sales

  - –(CA Board of Equalization)
  - –Inflation Corrected using Consumer Price Index (CPI)

Adjustment Method Factor Choices

- A jurisdiction may use:
  - Default (standard) countywide or jurisdiction-specific factors supplied by the Board
  - Alternative factors from independent third-party sources
- Each factor must be from same published source and use same method for both years

Adjustment Factors and Disposal Trends California, 1991-1999 (Base-Year = 1990)

Jurisdictions: Diverse & Dynamic

1999		1990 – 1999 Change
Pop:	85 to 3.8M	-31% to +223%
Emp:	460 to 4.4M	-21% to +64%
Txble Sls:	$155,000 to $28.4M	-50% to +171%*

*Adjusted for Inflation



The Adjustment Method

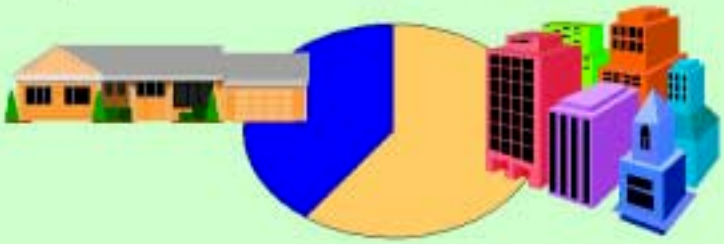
- Factor change reflects change in residential and commercial waste streams differently
- Must know what part of base-year waste stream is residential (the Residential Percentage)

% %

Jurisdictions Have Diverse Waste Stream Sectors

Residential Sector

- Smallest: < 0.01 % Residential
- Middle: 40 % Residential
- Largest: 97 % Residential



Adjustment Method Limits

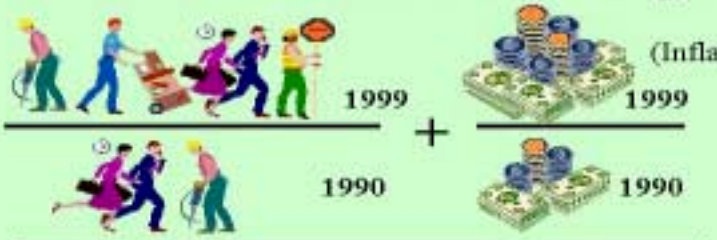
Waste generation sector change, and/or activities that have less impact on taxable sales, employment, and population, are not reflected by the adjustment method:

- –Disasters,
- –Military Base Closures,
- –Large Construction or Demolition Projects
- –Large changes in type of employment rather than number of employees
- –Changes in nature of production of solid waste over time
- –Only as good as base-year

The Adjustment Method Calculation

A Quick Review

Estimating Non-Residential Change



$$\frac{\frac{1999}{1990} + \frac{1999}{1990}}{2}$$

Economic Change Ratio

Estimating 1999 Non-Residential Generation

1990 Non-Residential Generation

X *Economic Change Ratio* =

1999 Non-Residential Generation

Estimating Residential Change

1999

1990

$$\frac{\text{1999} + \text{1990}}{2} \times \textit{Economic Change Ratio}$$

Demographic Change Ratio

Estimating 1999 Residential Generation

1990 Residential Generation

X *Demographic Change Ratio* =

1999 Residential Generation

Estimating 1999 Generation

1999 Non-Residential Generation

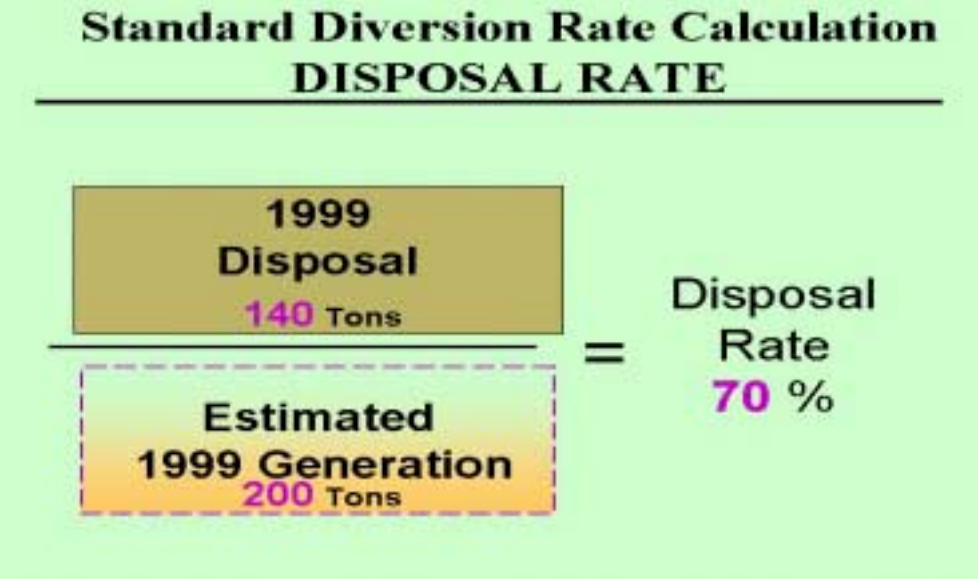
+

1999 Residential Generation

=

Estimated 1999 Jurisdiction Generation


Report Year Disposal Tons
1999
Disposal
Reporting System
145 Tons
PRC 41821.5
–
Disposal
Deductions
5 Tons
=
1999
Disposal
140 Tons
PRC 41782


Standard Diversion Rate Calculation
DISPOSAL RATE
1999
Disposal
140 Tons
Estimated
1999 Generation
200 Tons
=
Disposal
Rate
70 %

Standard Diversion Rate Calculation
DIVERSION RATE

MEETING 2

HOW DO ALTERNATIVE EMPLOYMENT MEASURES AFFECT 1999 DIVERSION RATES?

A SB 2202 Adjustment Method Working Group Discussion Paper

April 11, 2001

Introduction

An issue presented at both the January 25 and 31, 2001 SB 2202 public workshops and discussed at the March 6th Adjustment Method Working Group (AMWG) meeting concerned the applicability of alternative adjustment method factors (alternative factors) for use in the Adjustment Method (AM) formula. In this discussion, alternative factors are defined as a data series of the same type as the default factor, which may or may not be provided by the default factor source. In other words, alternative factors will measure the same type or category of data. An example of an alternative factor is Industry Employment. Currently, the AM formula uses Labor Force as the default factor for employment. Both the default and the alternative factor describes employment, but in different ways. Also, both of these employment measures are available from the same source, the California Employment Development Department (EDD). However, alternative factors need not be available from the same source that supplies the current default factor. While new types of AM factors, (factors which are not of the same type as default factors), were discussed by the AMWG, they are not covered in this paper.

The AMWG decided an examination of alternative factors should include how using alternative factors would ultimately effect the diversion rate calculation. In this discussion, alternative employment factors are used in the AM formula to compute a diversion rate. This substitution is not meant to be a rigorous or absolute examination of the accuracy of an alternative factor. The goal is to examine whether alternative factors have an effect on calculated diversion rates. If any of these alternative factors results in significantly different diversion rates for a substantial number of jurisdictions, then a more thorough analysis of the alternative factor should be considered.

Background
The Board's AM was developed per statutory requirements to establish a standard methodology to estimate future year generation tonnage. This methodology was developed under the guidance of a working group that examined many factors related to the rate of waste generation. After extensive statistical analysis, the adjustment factors selected were Labor Force **Employment, population, and Consumer Price Index (CPI)-adjusted taxable sales**. These factors are used in the diversion rate measurement calculation that adjusts base-year generation tonnage for changes in population and economic conditions between base-year and report-year to estimate report-year generation tonnage. Estimated report-year generation is then compared to report-year disposal tonnage to determine disposal and diversion rates. Population and taxable sales adjustment factors are available for each jurisdiction and county; Labor Force Employment is available for each county; and CPI is available statewide and for three metropolitan areas.

The data sources for default AM factors are:
Population Department of Finance – (jurisdiction and county level)
Employment EDD - (county level)
Taxable Sales State Board of Equalization – (jurisdiction and county level)
CPI U.S. Department of Labor – (3 metropolitan area levels); and California Department of Industrial Relations - (statewide level)

Alternative Employment Factor Diversion Rate Impact for 1999
In this discussion, we examine two alternative employment data series: EDD Industry and U.S. Department of Commerce, Bureau of Economic Analysis (BEA), Industry. We compare: (1) the default EDD Labor Force AM calculation to each alternative employment factor AM calculation, (2) both of the alternative employment factor AM calculations, and (3) the default EDD Labor Force AM calculation with a hybrid use of default EDD Labor Force in the residential adjustment factor (RAF) portion and alternative EDD Industry in the non-residential adjustment factor (NRAF) portion. All comparisons use a 1990 base-year with a 1999 report-year. Note that slight rounding errors may occur in the following data tables.

EDD Labor Force vs. EDD Industry

The default AM formula uses EDD Labor Force employment data. EDD also publishes employment data by industry. EDD Labor Force data reflects employment of individuals by "place of residence", whereas EDD Industry employment data reflects jobs by "place of work". According to EDD's Web page, *Employment by Industry Data Compared to Employment Data in Labor Force Statistics*[1], "In most geographic areas, the difference between (labor force) employment and industry employment is minimal. However, in areas such as Ventura County, where a large portion of the residence population commutes to Los Angeles County to work, Labor Force Employment can be almost 100,000 people higher than (Industry Employment)." The 1999 diversion rate impact of substituting EDD Industry for the default EDD Labor Force employment factor is:

DIVERSION RATE	# JURISDICTIONS	% OF 416 JURISDICTIONS
(no change)	131	31.5
+ 1%	116	27.9
- 1%	34	8.2
+ 2%	80	19.2
- 2%	20	4.8
+ 3% or more	31	7.5
- 3% or more	4	1.0
	416	100.0

This table displays the difference in terms of maximum diversion rate change.[2] Of the 416 jurisdictions compared, the diversion rate impact was 0% for 32% of the jurisdictions, ± 1% for 36% of the jurisdictions, ± 2% for 24% of the jurisdictions, and ± 3% or more for 9% of the jurisdictions.[3]

Does the alternative EDD Industry employment factor help "small" jurisdictions?[4] Of the 35 jurisdictions with a diversion rate difference of ± 3% or more, 60% are "small" in terms of report-year disposal, and about 54% are "small" in terms of report-year population. See the attached table, *Summary of Estimated Diversion Rate Calculations Using Default and Alternative Factors*, for more detail.

EDD Labor Force vs. BEA Industry

Similar to the above comparison, EDD Labor Force data reflects employment of individuals by "place of residence", whereas BEA Industry employment reflects jobs by "place of work".

---

[1] http://www.calmis.cahwnet.gov/file/resource/indlfcomp.htm

[2] **Maximum diversion rate = the highest estimated diversion rate**

[3] **Data for 29 jurisdictions were excluded due to negative diversion rates, or the jurisdiction or regional agency did not exist in 1990. A negative diversion rate is the result of an incorrect base-year generation amount, or an incorrect report-year disposal amount, or both. Both city level and county level factors were used in determining the highest estimated diversion rate for both default and alternative factor calculations.**

[4] For convenience, we define a jurisdiction with 1999 report-year disposal below 25,000 tons, or with population below 25,000 people, as "small". Of all 445 jurisdictions, 36% (166) meet this small disposal criterion, and 38% (171) meet this small population criterion.

The 1999 diversion rate impact of substituting BEA Industry for the default EDD Labor Force employment factor is:

DIVERSION RATE	# JURISDICTIONS	% OF 415 JURISDICTIONS
(no change)	139	33.5
+ 1%	107	25.8
- 1%	44	10.6
+ 2%	57	13.7
- 2%	28	6.7
+ 3% or more	35	8.4
- 3% or more	5	1.2
	415	100.0

This table displays the difference in terms of maximum diversion rate change.[2] Of the 415 jurisdictions compared, the diversion rate impact was 0% for 34% of the jurisdictions, ± 1% for 36% of the jurisdictions, ± 2% for 20% of the jurisdictions, and ± 3% or more for 10% of the jurisdictions.[5]

Does the alternative BEA Industry employment factor help "small" jurisdictions?[4] Of the 40 jurisdictions with a diversion rate difference of ± 3% or more, 50% are "small" in terms of report-year disposal, and about 45% are "small" in terms of report-year population. See the attached table, *Summary of Estimated Diversion Rate Calculations Using Default and Alternative Factors*, for more detail.

EDD Industry vs. BEA Industry

This comparison is of two different measures of employment by "place of work". If the measures are identical, there should be no diversion rate differences. The 1999 diversion rate impact of substituting BEA Industry for EDD Industry is:

DIVERSION RATE	# JURISDICTIONS	% OF 416 JURISDICTIONS
(no change)	269	64.7
+ 1%	37	8.9
- 1%	83	20.0
+ 2%	6	1.4
- 2%	8	1.9
+ 3% or more	6	1.4
- 3% or more	7	1.7
	416	100.0

This table displays the difference in terms of maximum diversion rate change.[2] While the results are very similar, the two employment measures are not identical. Of 416 jurisdictions compared, the diversion rate impact was 0% for 65% of the jurisdictions, ± 1% for 29% of the jurisdictions, ± 2% for 3% of the jurisdictions, and ± 3% or more for 2% of the jurisdictions.[3] See the attached table, *Summary of Estimated Diversion Rate Calculations Using Default and Alternative Factors*, for more detail.

[5] Data for 30 jurisdictions were excluded due to negative diversion rates, or the jurisdiction or regional agency did not exist in 1990. A negative diversion rate is the result of an incorrect base-year generation amount, or an incorrect report-year disposal amount, or both. Both city level and county level factors were used in determining the highest estimated diversion rate for both default and alternative factor calculations.

EDD Labor Force vs. EDD Labor Force RAF/EDD Industry NRAF

If Industry employment is a more accurate employment measure for the non-residential portion of a waste stream, then might it be appropriate to apply it only to the non-residential portion of the calculation? Using EDD Labor Force as the default or baseline, we compare the 1999 diversion rate impact of doing so:

DIVERSION RATE	# JURISDICTIONS	% OF 416 JURISDICTIONS
(no change)	167	40.1
+ 1%	33	7.9
- 1%	144	34.6
+ 2%	9	2.2
- 2%	43	10.3
+ 3% or more	3	0.7
- 3% or more	17	4.1
	416	100.0

This table shows the difference in terms of maximum diversion rate change.[2] Of the 416 jurisdictions compared, the diversion rate impact was 0% for 40% of the jurisdictions, ± 1% for 43% of the jurisdictions, ± 2% for 13% of the jurisdictions, and ± 3% or more for 5% of the jurisdictions.[3]

Does this hybrid alternative employment factor help "small" jurisdictions?[4] Of the 20 jurisdictions with a diversion rate difference of ± 3% or more, 60% are "small" in terms of report-year disposal, and 50% are "small" in terms of report-year population.

Does this alternative employment factor help jurisdictions with very high base-year non-residential waste generation? For convenience, we define these jurisdictions to include those with more than 80% base-year non-residential waste generation. Of all 445 jurisdictions, 27 (6%) meet this criterion. Of the 20 jurisdictions with a diversion rate difference of ± 3% or more, two (10%) have a base-year non-residential generation percentage above 80%. See the attached table, *Summary of Estimated Diversion Rate Calculations Using Default and Alternative Factors*, for more detail

.

HOW DOES BOE'S TAXABLE SALES DEFLATOR DIFFER FROM THE CPI?

A SB 2202 Adjustment Method Working Group Discussion Paper

(April 11, 2001)

Introduction

At the first SB 2202 Adjustment Method Working Group (AMWG) meeting, members discussed an alternative inflation measure to adjust report-year taxable sales. This alternative is the State Board of Equalization's (BOE) California Taxable Sales Deflator. It is important to note that the BOE deflator is calculated using U. S. Department of Commerce, Bureau of Economic Analysis (BEA) implicit price deflator data for BOE selected categories of goods and services. In this discussion paper, we examine the feasibility of using the California Taxable Sales Deflator with the California Integrated Waste Management Board's (CIWMB) Adjustment Method, and discover some unforeseen challenges.

What's positive about BOE's deflator?

BOE claims their deflator is a more appropriate method to correct or adjust taxable sales for inflation because it measures the change in price of only those commodities subject to the California Sales And Use Tax. BOE also states: "The California Consumer Price Index (CCPI) on the other hand, measures the change in prices of a broader spectrum of goods and services. In particular the CCPI measures such non-taxable items as housing, utilities and medical care services."[6] From these statements, it appears that using the BOE deflator may be a more appropriate method to adjust taxable sales for inflation. However, there are technical issues that make applying the BOE deflator problematic.

How is BOE's deflator applied?

The BOE deflator is published in BOE's *Taxable Sales In California (Sales & Use Tax)* Annual Report. The deflator's intended purpose is to adjust taxable sales for the year prior and the report year. In other words, for report-year 1999, the deflator adjusts taxable sales amounts for 1998 and 1999 relative to an earlier benchmark year, (1996), so that each amount may be examined in constant dollars to determine if real growth occurred. (The BEA implicit price deflator base-year determines the BOE deflator base-year.) Although the BOE deflator may be applied to non-adjacent years, for example 1996 and 1999, it is important to understand that this is not the BOE deflator's intended purpose.

The Adjustment Method formula is applied to both adjacent years (example, 1998 base-year, 1999 report-year) and non-adjacent years, (example, 1990 base-year and 1999 report-year). Unlike the CPI, the BOE deflator cannot be easily computed "backwards" prior to 1996. According to BOE: "The California taxable sales deflator is not an index and cannot be applied like an index."[7] In fact, when requested to compute a 1990 base-year for its deflator, BOE was not prepared to immediately respond. This is consistent with the fact that generally BOE does not use its deflator for other than the report-year and the prior year. In its present form, the BOE deflator might be used in the Adjustment Method by jurisdictions with 1996 and later base-years (but only if BEA continues using a 1996 benchmark year), i.e., currently 68 jurisdictions have a base-year of 1996 or a subsequent year.

[6] BOE Fax, California Taxable Sales Deflator, 3/26/01.

[7] BOE Fax, Applying the California Taxable Sales Deflator, 3/26/01.

Application Issues

CIWMB does not yet have sufficient data to determine the feasibility of using the BOE deflator as a default factor or as an alternative factor. CIWMB has requested BOE to provide an example of how its deflator may be used for years prior to 1996. To fulfill this request, BOE needs to use U. S. Department of Commerce, Bureau of Economic Analysis (BEA) implicit price deflator data. This BEA data is applied to appropriate taxable sales "type of business" categories to compute the BOE deflator. Currently, BOE uses the following BEA indexes to compute their deflator[8]:

Personal Consumption Expenditure Price Indexes
- Non-durable Goods
  - Clothing & Shoes
  - Gasoline & Oil
  - Fuel Oil & Coal
  - Other Non-durable Goods
- Durable Goods
  - Motor Vehicles & Parts
  - Furniture & Household Equipment
  - Other Durable Goods

Private Fixed Investment Price Indexes
- Construction & Building*
- Producers' Durables Equipment

* The construction and building index is an average of the "residential structures" index and the "nonresidential structures" index.

BOE staff report that these index categories have not been consistent since 1989 because of changes BEA has made to these categories. Another interesting point to consider is that BEA indexes are nationwide. BEA price index data specific to California are not available.

BOE Deflator Fact And Issue Summary

FACTS

- The BOE deflator is designed to adjust adjacent year taxable sales values. For this purpose, BOE claims the deflator is better than CCPI.
- The BOE deflator is not an index, and cannot be used as one, which makes it's application in the Adjustment Method formula more complicated than using CPI.
- The BOE deflator relies on U.S. price index data, not California (State or Metropolitan Area) price index data.
- Currently, the BOE deflator uses a 1996 base-year because BEA uses a 1996 base-year.

ISSUES

- The definitions for components of BEA's Personal Consumption Expenditure Price Indexes and Private Fixed Investment Price Indexes changed in 1994, and it is not clear how often this change occurs. Since BEA's implicit price deflators for each of these components are used to construct the BOE deflator, it is not clear if a 1990 BOE deflator value would meet a "same methodology" requirement for a 1999 BOE deflator value.
- If BOE calculates a 1990 deflator value, it may not match the 4.4% deflator value published in BOE's

[8] BOE Fax, California Taxable Sales Deflator, 3/26/01.

1990 Taxable Sales In California (Sales & Use Tax) Annual Report. This may cause confusion.

- It is not clear how often BEA changes its benchmark or base-year.

IS IT FEASIBLE TO STATISTICALLY ANALYZE THE ADJUSTMENT METHOD?

A SB 2202 Adjustment Method Working Group Discussion Paper

MARCH 2001

I. Introduction

The Board has heard about many issues regarding the diversion rate measurement system. Many issues have been raised during the Board's Biennial Review on the progress each city, county and regional agency has made in implementing diversion programs to achieve the diversion requirements. Adjustment Method issues were identified at a September 2000 Board workshop on diversion rate measurement, and subsequently at January 25 and 31, 2001 SB 2202 workshops.

In response to these issues, the question arises: Should a new statistical analysis of the Adjustment Method be conducted to: 1) test the validity (correlation of Adjustment Method factors with actual waste generation) and accuracy (standard deviation) of the current Adjustment Method, and 2) compare alternative formulas to the current one? This discussion paper examines what data would be needed, what data exist, existing data limitations, and alternatives to using existing data.

II. Background

The Adjustment Method was developed per statutory requirements to establish a standard methodology for estimating future waste generation tonnages. This methodology was developed under the guidance of a working group that examined many factors related to the rate of waste generation.

In May 1993 CIWMB contracted with UCLA Extension, Department of Engineering, to identify essential adjustment factors. Economic and non-economic factors were individually reviewed, then organized in a summary matrix form. This matrix was analyzed, weighed and presented first through a public involvement process and then to the AB 2494 Adjustment Method Working Group for evaluation. Economic and non-economic factor analysis information was presented at the first Working Group workshop on September 16, 1993. Among these factors were: natural disasters, man-made disasters such as riots and industrial accidents, meteorological and climate factors, local economies, number of households, tax base, land type and use, social demographic factors, other regulations, military cutbacks, and population movement. Factors that were included within other factors were identified to narrow the field. Then the remaining factors were weighed on a scale from one to ten by each member of the Working Group, and the results were statistically tabulated in average order of importance. The top six factors were chosen. The Working Group then recommended which factors should be included in formulating a diversion rate quantification methodology for California. The six factors were:

(1) Population: Affects the amount of waste generated.
(2) Employment: Affects industrial and commercial waste.
(3) Wages & Salaries: Indicates the question of affluence and its affect on producing solid waste.
(4) Taxable Transactions: How much money was spent in buying products.
(5) Building Permits: Concerns all of the above.
(6) Special Events: Involves disasters such as earthquakes, floods, mud. Special Events was held in abeyance until more information could be obtained.

After extensive statistical analysis, a subsequent test formula included only the following factors because the data for these factors were readily available and easy to use, whereas the other three factors required interpolation:
(1) Population.
(2) Employment.
(3) Taxable Transactions.
These factors are used in the diversion rate measurement calculation that begins by adjusting base-year generation tonnage for population and economic change between the base-year and report-year to estimate report-year generation tonnage. The estimated report-year generation tonnage is then compared to measured report-year disposal tonnage from the Disposal Reporting System (DRS) to determine the diversion rate. Adjustment factors are available for each jurisdiction and county.

Other Adjustment Method formulas were considered but rejected because they projected too much waste, did not differentiate between commercial, residential, and industrial waste, were too difficult to use, and had inconsistent uniformity.

III. Data Needed

To perform a statistical analysis, specific data is needed. The Adjustment Method uses several factors (independent variables) to predict waste generation (dependent variable). The Adjustment Method was developed using a regression analysis to identify the independent variables that best estimated waste generation.

Independent Variables

Current independent variables, or adjustment factors, used in the Adjustment Method are population, employment, taxable sales, and the CPI to adjust report-year taxable sales for inflation. The Adjustment Method formula calculates two ratios known as the Non-Residential (Commercial/Industrial) Adjustment Factor (NRAF or CIAF) and the Residential Adjustment Factor (RAF). The NRAF is calculated by averaging the percentage change in employment with the percentage change in inflation adjusted taxable sales. The RAF is calculated by averaging the percentage change in population with the NRAF. The NRAF and RAF formulas are:

$$NRAF = \frac{(ER/EB) + \{(CB/CR \times TR/TB)\}}{2}$$

And:

$$RAF = \frac{(PR/PB) + NRAF}{2}$$

Where: PR = Report-Year Population PB = Base-Year Population
ER = Report-Year Employment EB = Base-Year Employment
CR = Report-Year CPI CB = Base-Year CPI
TR = Report-Year Taxable Sales TB = Base-Year Taxable Sales

The current CIWMB default (standard) adjustment factors are: 1) California Department of Finance (DOF) January 1 population estimates for counties and jurisdictions (cities and unincorporated areas); 2) California Employment Development Department (EDD) Annual Average Civilian Labor Force Employment (by place of residence) estimates for counties; 3) California Board of Equalization (BOE) Taxable Sales In California (Sales & Use Tax) for counties and cities; and 4) California Department of Industrial Relations (DIR) statewide average CPI, plus the U.S. Department of Labor CPI for three

metropolitan areas[9]. Note the BOE taxable sales data release schedule forces the Board to estimate 4th quarter taxable sales each year[10].

Dependent Variable

The dependent variable, or what the Adjustment Method estimates, is waste generation. Current law requires each jurisdiction conduct a base-year waste generation study. The base-year generation tonnage is split into residential and non-residential waste amounts. A jurisdiction's base-year residential percentage is determined by dividing base-year residential waste generation tons by base-year generation tons. The NRAF (average of the percentage changes in employment and inflation-adjusted taxable sales from base-year to report-year) is then applied to the non-residential portion, and the RAF (average of the percentage change in population and the NRAF) is applied to the residential portion of the base-year generation amount. The results are the estimated report-year residential and non-residential generation amounts, which are added to get total estimated report-year waste generation tons.

To test the current Adjustment Method, actual waste generation, or a proxy for actual waste generation is needed for at least two years for a number of jurisdictions, as the regression analysis would look at change from a "base-year" to a "report-year." However, standard statistical practice requires that data for at least three years be used for such an analysis to be statistically valid. In a recent consultation with Denis Keyes, the Board's consulting statistician, he stated: "if each jurisdiction was examined individually, at a minimum, you would need at least total Generation for one more than the number of predictor variable years. Here this would require a total Generation series for at least 4 years in each jurisdiction. As far as I know, this series does not exist."

The current Adjustment Method was established using disposal tonnage as a proxy for generation tonnage because of the lack of generation data, and because at that time (1991-1993) the statewide disposal rate was relatively stable (89-90%). It was assumed that base-year diversion remained constant from 1991-1993. Many factors were tested for correlation with disposal. Population, employment, and CPI-adjusted taxable sales were selected due to their strong correlations with disposal, and because they were readily available for all jurisdictions and were understood by stakeholders.

IV. Issues

The Independent Variables: Adjustment Factors

One basic concept of the Integrated Waste Management Act (Act) is that diversion requirements of the Act are implemented based upon jurisdictional boundaries. Each city and county (and regional agency) is responsible for diverting the waste that is generated within its borders. The amount of diversion for each jurisdiction is determined by comparing the amount of waste generated within the jurisdiction during the base-year (adjusted for population and economic change) with the amount disposed in the report-year. To comply with Legislative intent that the diversion rate be accurately determined, the most representative measures of population and economic change should be used, i.e., jurisdiction or countywide measures, whichever are more representative of the jurisdiction[11].

---

[9] The U.S. Department of Labor, Bureau of Labor Statistics (BLS) publishes CPI data for the following three metropolitan areas: 1) Los Angeles-Anaheim-Riverside; 2) San Francisco-Oakland-San Jose; and 3) San Diego. The California Department of Industrial Relations estimates statewide CPI by taking a weighted average of the CPI for Los Angeles-Anaheim-Riverside and San Francisco-Oakland-San Jose.

[10] 4th quarter taxable sales are estimated using the rate of change from 3rd to 4th quarter in the previous year.

[11] Public Resources Code Section 41781.2(a)(2) states "It is further the intent of the Legislature in enacting this section to ensure that compliance with the diversion requirements of Section 41780 shall be accurately determined based upon a correlation between solid waste which was disposed of at permitted disposal facilities and diversion

Current Adjustment Method factors (i.e., population, employment, and taxable sales) are readily available at least at the county level each year. While population and taxable sales are available for cities, unincorporated areas, and counties, employment is only readily available countywide. Therefore, many jurisdictions have suggested that countywide employment growth/decline does not accurately represent change at the jurisdiction level. A common example of this criticism of countywide employment is where city population and taxable sales have grown significantly, but countywide employment has grown only slightly, or even declined. While countywide employment is an accurate measurement (estimated standard deviation is $\pm$ 1.0%), it may not be representative for the unincorporated area or a city[12]. According to Denis Keyes, "for many jurisdictions (place-of-residence employment) does not cause a problem, but for others it does", and "county indexes may not reflect jurisdiction level indexes".

One alternative to Civilian Labor Force Employment is EDD's Industry Employment ("Total All Industries," by place of work). Using Industry Employment within the NRAF may be a more accurate predictor of non-residential waste generation. A variation of this alternative is using Industry Employment within the NRAF and the RAF. In either case, one problem with Industry Employment is that prior to 1993 this "Total All Industries" data series is not published for each county[13]. It is unavailable for 361 of 445 (81%) jurisdictions that currently have base-years prior to 1993.

A second alternative to Civilian Labor Force Employment is the U.S. Department of Commerce, Bureau of Economic Analysis (BEA), *Wage and Salary Employment for Counties and Metropolitan Areas, Full- and Part-Time by Place of Work* beginning 1969. Board staff are compiling data on the default 1999 waste generation estimate and diversion rate impact of substituting BEA employment for Civilian Labor Force Employment.

The Adjustment Method currently uses the CPI to adjust report-year taxable sales for inflation. There are at least two alternative inflation indicators available from Federal and State agencies. These include the Producer Price Index, available from the U.S. Department of Labor's Bureau of Labor Statistics, and BOE's Taxable Sales Deflator. In addition to a Board staff search for AB 2494 documentation on selection of the CPI for use in the Adjustment Method, a review of the Producer Price Index and BOE's Taxable Sales Deflator by selected members of the SB 2202 Adjustment Method Working Group is underway.

The Dependent Variable: Generation

The current Adjustment Method is based on statistical research demonstrating that waste generation is strongly correlated with the adjustment factors (population, employment, and taxable sales)[14]. At the time

---

claims which are subsequently made for that solid waste."

[12] CIWMB AB 2494 Uniform Methodology Study: Statistical Documentation for the Selection of Adjustment Factors for the 12-31-93 Testing Draft, Base-Year Adjustment Method User's Guide, University of California at Los Angeles Extension, Municipal Solid Waster Management Certificate Program, by Daryl O. Metz, p.4.

[5] Industry employment for 14 Counties are included only in Metropolitan Statistical Areas (MSA) prior to 1993. These MSAs are: Oakland PMSA (Alameda and Contra Costa counties); Sacramento PMSA (Sacramento, Placer and El Dorado counties); Fresno MSA (Fresno and Madera counties); Vallejo-Fairfield-Napa PMSA (Napa and Solano counties); Riverside-San Bernardino PMSA (Riverside and San Bernardino counties); San Francisco PMSA (Marin, San Francisco and San Mateo counties); and Yuba City MSA (Sutter and Yuba counties).

[14] Analysis of Field Testing Results of the 12-31-93 Testing Draft, Base-Year Adjustment Method User's Guide, Dr.

of the original Adjustment Method study, waste generation data was not available on a broad scale over a period of 2 or more years. However, because the California Board of Equalization (BOE) collects a per ton fee from landfills for each ton disposed, disposal by landfill and county were available for every quarter and year. Also, disposal/diversion rates were relatively stable between 1990 and 1993. Therefore, disposal was used as the proxy for waste generation. The Adjustment Method makes no distinction between diversion and disposal; it simply estimates report-year waste generation. Therefore, the Adjustment Method cannot be applied only to disposal, or only to diversion, if the relative levels of disposal and diversion (i.e., the diversion rate) have changed between the base-year and the report-year.

This brings us to the question: Can we justifiably use existing (1995-1999) Disposal Reporting System (DRS) disposal data as a proxy for generation in a regression study to determine if the Adjustment Method model still applies? The answer is somewhat complicated by several factors. First, DRS tonnage estimates may include considerable error for smaller jurisdictions. Board staff analysis of a 1997 Board-contracted study by UCLA found that jurisdictions disposing under 50,000 tons per year could have up to 30% error when disposal facilities conduct only the statutorily required one-week waste origin survey per quarter instead of daily waste origin surveys[15]. It is important to test the Adjustment Method for all types and sizes of jurisdictions, and there may be issues with DRS data for smaller jurisdictions. Board staff is consulting with Denis Keyes on ways to eliminate or reduce DRS error. This is a necessary first step in determining if disposal could be an appropriate proxy for waste generation.

Second, since the Adjustment Method makes no distinction between diversion and disposal, DRS disposal data may not be a valid proxy for generation. DRS was launched in 1995, the same year that jurisdictions were required to divert 25% of generated waste from landfills. Because of this diversion requirement, jurisdictions began implementing diversion programs in the early 1990's, and continue to implement and expand them to this date. Therefore, from 1995 through 1999, DRS disposal amounts were impacted differently because jurisdictions implemented different levels of diversion programs as well as expanded existing diversion programs. Essentially, DRS disposal data does not reflect a constant diversion rate from 1995 to 1999 because jurisdictions have gradually implemented and enhanced diversion programs over time to increase their diversion rates. According to Denis Keyes, "DRS Disposal should not be used as the dependent variable as a substitute or proxy for Generation." Keyes goes on to say that disposal "… would be [appropriate] if we could factor out changes due to program implementation. That is a possibility, and I would like to look at this further…we would still need to assume that Diversion would move in the same way as Disposal, so that Disposal could be used as a proxy for Generation."

Third, the current Adjustment Method formula requires that base-year generation be split into residential and non-residential sectors, but disposal is not reported to CIWMB by sector. Therefore, we do not know how much disposal is residential and how much is non-residential. A couple sources have been suggested for estimating this split. The first is jurisdiction base-year residential and non-residential percentages. However, because most jurisdictions estimated these values ten years ago in their original Solid Waste Generation Studies, these estimates may be inaccurate or out-of-date. The second suggested source for estimating residential and non-residential percentages is CIWMB's 1999 Statewide Waste (Disposal) Characterization Study. However, individual jurisdiction estimates may be inaccurate because they would be based on statewide and regional averages.

Eugene Tseng, UCLA Extension, pp.7-11.

[15] *California Integrated Waste Management Board, Disposal Reporting System Study*, February 1997, University of California at Los Angeles Extension, Waste Management and Recycling Program.

There is a substantial amount of work required to review the potential for using disposal data as a proxy for generation. Staff is working with Denis Keyes to identify expected cost and time to determine if disposal would be appropriate.

Finally, due to the lack of actual waste generation data, or a valid proxy (e.g., disposal) for waste generation data, the last complicating factor is cost. Gathering a sufficiently large body of waste generation data would take several years, and may be cost prohibitive. However, this is most likely the best option in terms of accuracy. It would allow us to determine the current validity of the Adjustment Method.

V. Options

There are many issues associated with the data needed to run the regression analysis. Some options are:

1. Conduct a statewide waste generation study where generation data from a representative sample of jurisdictions, or from all jurisdictions, would be measured over a period of several years. Although this should be the most accurate option, it would probably cost millions of dollars.
2. Use DRS disposal as a proxy for waste generation. However, as outlined above, there are complicating factors if DRS data is used: 1) DRS accuracy; 2) changes in diversion program implementation over time; and 3) DRS data is not reported by residential vs. non-residential sector.

March 20, 2001

TO: Tim Hall
California Integrated Waste Management Board

FROM: Denis Keyes
Consultant

SUBJECT: MARGIN OF ERROR FOR ADJUSTMENT METHODOLOGY ANNUAL GENERATION TONS

The best way to determine if a "margin of error" can be calculated on the Adjustment Methodology Annual Generation Tons is to list the principal sources of error, and then determine if these errors can be calculated.

The major steps in estimating Annual Generation Tons for a reporting year are:

Do a Base Year Generation study to determine Annual Generation in the Base Year.
Obtain jurisdiction demographic and economic information such as population, employment, and taxable sales.
Take the information from Steps 1 and 2 and plug these numbers in the Adjustment Methodology Formula.

I will examine each step with regard to the total error formula we discussed. The total error is called the Root Mean Square Error or RMSE. The formula is:

$$Root\ Mean\ Square\ Error\ (RMSE) = \sqrt{(Bias)^2 + (Standard\ Error)^2}$$

Standard Error is the error due to taking a random sample in the jurisdiction, or the standard deviation from a survey. For example, to estimate commercial/industrial sector generation, the jurisdiction may have taken a random sample of sites, and conducted a waste audit of the selected sites. Assuming that accurate information was obtained from each site surveyed, this error comes about because not every business in the jurisdiction was surveyed.

Bias occurs when incorrect information was obtained from sampled sites, or, completely aside from sampling, some of the methodology used to produce the estimates is faulty.

For each of the 3 steps above, here is what I see with regard to standard error and bias, and if they can be calculated:

Base Year Generation Study

Although the jurisdiction may not have provided a standard error for any study they conducted, it could be obtained or estimated.

Some major sources of bias in base year generation studies include:

Incorrectly counting disposal or diversion tons from any survey, or double counting them (e. g. some materials may have been counted incorrectly or twice, or restricted materials were incorrectly counted) Omitting some types of businesses from any survey, or incorrectly counting their generation tons (e. g. only headquarters tons are counted for a Construction/Demolition firm, and not work site tons)

Errors in calculating final numbers.

These biases may not be small, and may be much larger than the standard error for their survey. Unfortunately, the size of them cannot be easily estimated.

Demographic and Economic Factors

Since these are not usually derived from a sample survey, any errors here would count as bias. Some agencies that provide population, employment, or taxable sales data do provide error estimates for them. The amount of this bias could be calculated, if available.

Adjustment Methodology Itself

Even though the base year generation study had no bias, and the demographic/economic factors were correct, if the methodology was not formulated correctly, serious biases could result. For example, currently the non-residential factor assumes that employment and taxable sales should be equally weighted for each jurisdiction. If this is incorrect, bias is entered. Here again, this bias cannot be estimated at this time.

Summary

I believe the major sources of bias in the current Adjustment Methodology are bias in the base year generation study, and the Adjustment Methodology itself. These cannot be estimated at this time, so it is not possible to obtain a margin of total error for the Adjustment Methodology Generation Tons.

DO CIWMB ESTIMATES OF FOURTH QUARTER TAXABLE SALES ADD ERROR TO ADJUSTMENT METHOD ESTIMATES OF WASTE GENERATION (AND THE DIVERSION RATE)?

A SB 2202 Adjustment Method Working Group Discussion Paper

APRIL 2, 2001

Background

One issue presented at the January 25 and 31, 2001 SB 2202 public workshops on Goal Measurement and Disposal Reporting Potential Solutions was the accuracy of CIWMB's estimate of report-year fourth quarter taxable sales. CIWMB is forced to estimate report-year fourth quarter taxable sales because the August 1 Annual Report due date precedes a mid-August to mid-September Board of Equalization (BOE) publication date for fourth quarter taxable sales. Beginning 1998, CIWMB's default (standard) value for report-year taxable sales is the sum of final BOE first and second quarter data, preliminary BOE third quarter data, and CIWMB's fourth quarter estimate. To avoid confusion and administrative complications, CIWMB does not revise these published values. The fourth quarter estimate is reached by applying the prior year third-to-fourth quarter percentage change to the report-year third quarter taxable sales amount. Actual data for Ukiah (Mendocino County) are presented below to illustrate the difference in values. Note the difference between Q1-Q4 Total BOE Final Values (278,820) vs. Q1-Q4 Total CIWMB Estimate (278,127).

1999 Ukiah Taxable Transactions in Thousands of Dollars

Q1	Q2	Q3	Q4	Q1-Q4 Total	BOE Annual Report
BOE Preliminary (News Release) Values					
60,029	72,091	69,587	77,113	278,820	n/a
BOE Final (Quarterly Report) Values					
60,029	72,091	69,587	77,113	278,820	**278,820**
CIWMB Estimate (BOE Final Q1, Q2, + BOE Preliminary Q3, + CIWMB Estimate Q4)					
60,029	72,091	69,587	**76,420**	**278,127**	n/a

CIWMB estimated the Ukiah 1999 taxable sales amount at $278,127 (x 1,000), but BOE's subsequent 1999 Annual Report value was $278,820 (x 1,000). Using the CIWMB Estimate, Ukiah's default

maximized 1999 waste generation was estimated at 19,142 tons[16]. If instead BOE's 1999 Annual Report amount is used, Ukiah's default maximized 1999 waste generation is estimated at 19,161 tons, a difference of 19 tons, or 0.1%. What was the impact of the CIWMB Estimate error on Ukiah's estimated maximum diversion rate? Rounded to the nearest whole percent, none. In both cases the estimated maximum diversion rate was 20%. See the attached report, *1999 BOE Annual Report Taxable Sales vs . CIWMB Taxable Sales Estimate,* for similar data on all AB 939 jurisdictions.

How Large Is This Error & How Often Does It Occur?

The attached report has 394 valid comparisons of the 1999 diversion rate impact of the CIWMB Taxable Sales Estimate compared to the BOE Annual Report Taxable Sales amount[17]. Of the 394 jurisdictions compared, the diversion rate impact was 0% for 70% of the jurisdictions, and ±1% for 26% of the jurisdictions.

[16] Maximized = the highest estimated diversion rate.

[17] Data on 51 jurisdictions were excluded due to negative diversion rates or default taxable sales measurement levels that did not match. A negative diversion rate is the result of an incorrect base-year generation amount, or an incorrect report-year disposal amount, or both. Because using city level rather than county level taxable sales may result in a different diversion rate, isolating a diversion rate difference due only to CIWMB taxable sales estimate error requires use of the same taxable sales measurement level for a valid comparison.

DIVERSION RATE	# JURISDICTIONS	% OF 394 JURISDICTIONS
(no change)	277	70.3
+ 1%	27	6.9
- 1%	76	19.3
+ 2%	3	0.8
- 2%	6	1.5
+ 3% or more	3	0.8
- 3% or more	2	0.5
	394	100.0

In the future, the diversion rate impact of CIWMB's taxable sales estimate error may change when more jurisdictions use base-year and report-year CIWMB estimated taxable sales values, i.e., the base-year is 1998 or later. Currently, 53 jurisdictions have a 1998 or later base-year, and for these jurisdictions in 1999, the error size is smaller and the error frequency is lower (see table below

Jurisdictions With 1998 & Later Base-Years

DIVERSION RATE	# JURISDICTIONS	% OF 42 JURISDICTIONS[18]
(no change)	31	73.8
+ 1%	1	2.4
- 1%	8	19.0
+ 2%	1	2.4
- 2%	1	2.4
+ 3% or more	0	0.0
- 3% or more	0	0.0
	42	100.0

How Can This Error Be Reduced Or Avoided?

Monitor yearly change in CIWMB's Taxable Sales Estimate error to trigger work on an improved taxable sales estimation formula, if needed.

[18] Data on 11 jurisdictions were excluded due to negative diversion rates or default taxable sales measurement levels that did not match.

CIWMB could issue an Annual Taxable Sales Estimate Error Advisory to all AB 939 jurisdictions after the mid-August to mid-September BOE release of Fourth Quarter *Taxable Sales In California*, or after the early October to late December release of BOE's *Taxable Sales In California* Annual Report. (For a few jurisdictions, the Annual Report value may reflect corrections to one or more of the Quarterly Report values.)

Jurisdictions may monitor the BOE Website for release of Quarterly Reports and/or the BOE Annual Report, and if needed, amend their AB 939 Annual Report to CIWMB.

INTERACTIONS BETWEEN THE ADJUSTMENT METHOD, BASE-YEAR GENERATION, AND REPORT-YEAR DISPOSAL

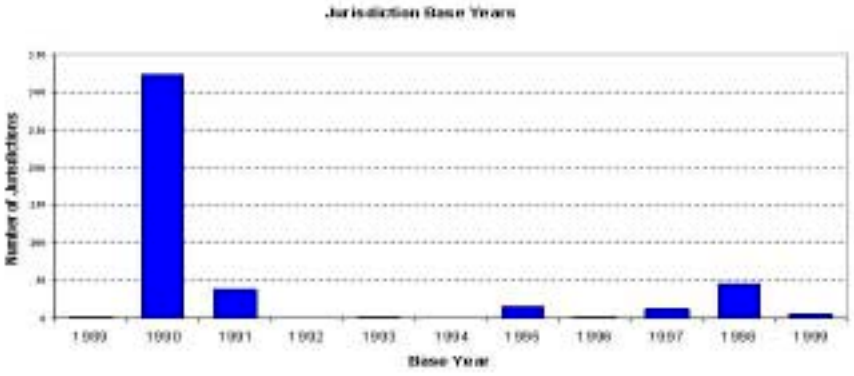
Interactions Between The Adjustment Method, Base-Year Generation, & Report-Year Disposal

Diversion Rate Estimate Caution Signals

Possible Sources Of Estimate Error

Does Base-Year Age Matter?

- Most jurisdictions have 1990 Base-Years

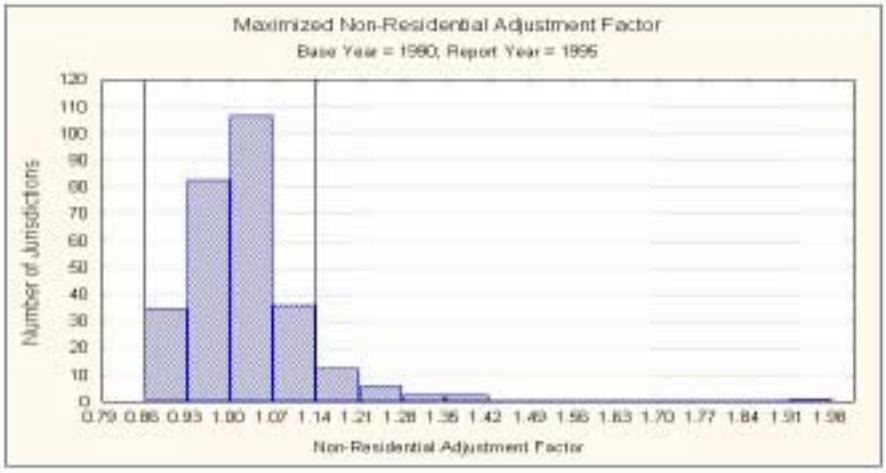


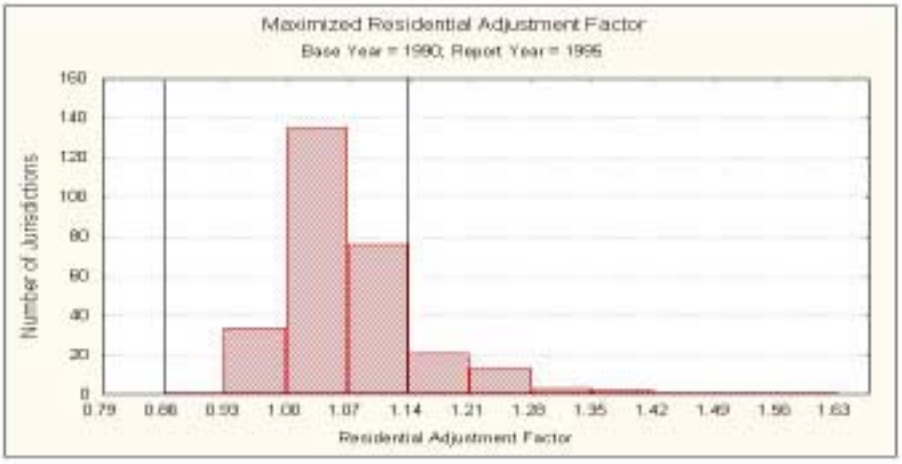
Does Base-Year Age Matter?

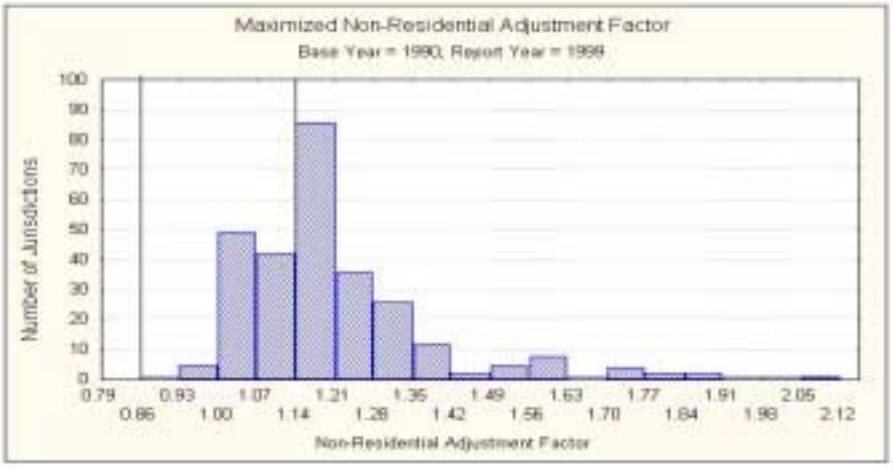
- Issue:
  - Original Adjustment Method Working Group lacked data to analyze Adjustment Method accuracy when residential and non-residential sector growth exceeds 14%
    - Error increases as the growth rate increases

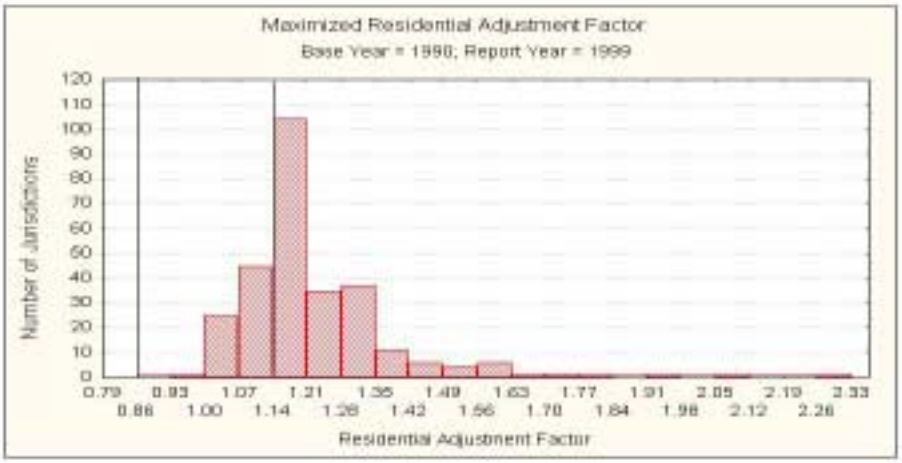
Standard Deviation and Confidence Interval of Adjustment Factors

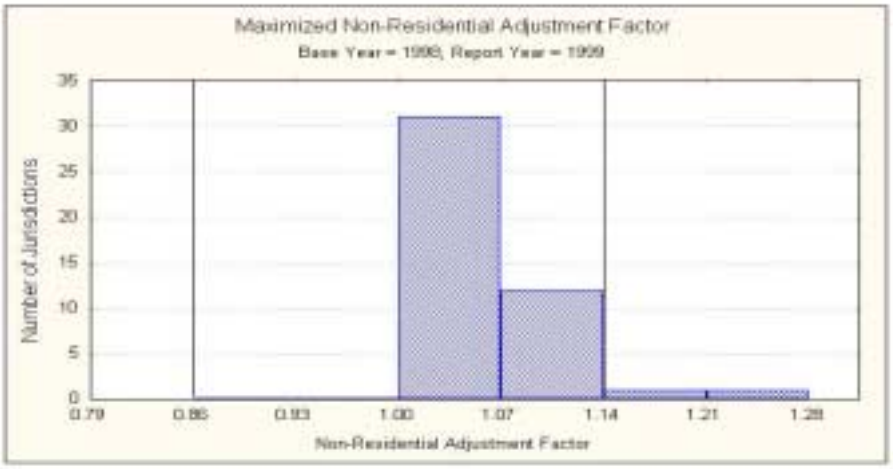
Rate of Growth	City Level		County Level	
Residential Adjustment Factor	Standard Deviation	95% Confidence Interval	Standard Deviation	95% Confidence Interval
2%	5.3%	± 10.6%	1.3%	± 2.6%
4%	5.4%	± 10.8%	1.3%	± 2.6%
6%	5.4%	± 10.8%	1.4%	± 2.8%
8%	5.5%	± 11.0%	1.4%	± 2.8%
10%	5.5%	± 11.0%	1.4%	± 2.8%
12%	5.6%	± 11.2%	1.5%	± 3.0%
14%	5.6%	± 11.2%	1.5%	± 3.0%
Non-Residential Adjustment Factor				
2%	0.8%	± 1.6%	0.8%	± 1.6%
4%	0.8%	± 1.6%	0.8%	± 1.6%
6%	0.8%	± 1.6%	0.8%	± 1.6%
8%	0.9%	± 1.6%	0.9%	± 1.6%
10%	0.9%	± 1.8%	0.9%	± 1.8%
12%	0.9%	± 1.8%	0.9%	± 1.8%
14%	0.9%	± 1.8%	0.9%	± 1.8%

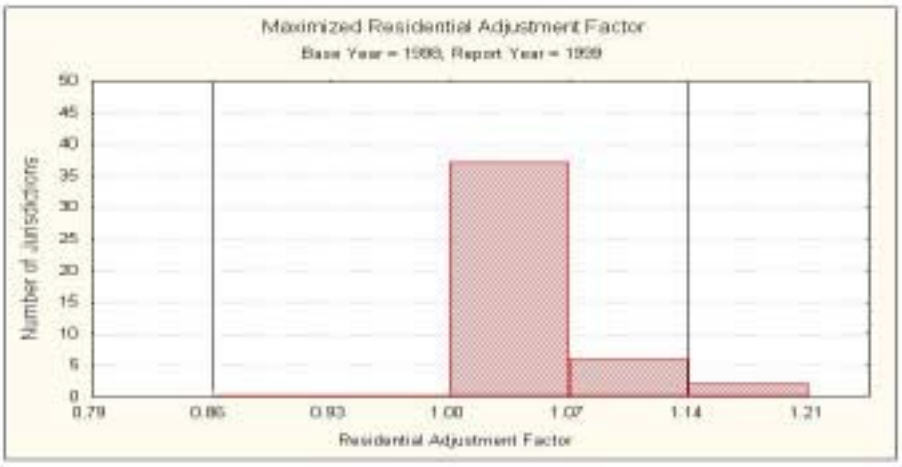

Maximized Non-Residential Adjustment Factor
Base Year = 1990; Report Year = 1995
Number of Jurisdictions
0
10
20
30
40
50
60
70
80
90
100
110
120
0.79 0.86 0.93 1.00 1.07 1.14 1.21 1.28 1.35 1.42 1.49 1.56 1.63 1.70 1.77 1.84 1.91 1.98
Non-Residential Adjustment Factor


Maximized Residential Adjustment Factor
Base Year = 1990; Report Year = 1995
Number of Jurisdictions
0
20
40
60
80
100
120
140
160
0.79 0.86 0.93 1.00 1.07 1.14 1.21 1.28 1.35 1.42 1.49 1.56 1.63
Residential Adjustment Factor


Maximized Non-Residential Adjustment Factor
Base Year = 1990; Report Year = 1999
Number of Jurisdictions
100
90
80
70
60
50
40
30
20
10
0
0.79
0.86
0.93
1.00
1.07
1.14
1.21
1.28
1.35
1.42
1.49
1.56
1.63
1.70
1.77
1.84
1.91
1.98
2.05
2.12
Non-Residential Adjustment Factor

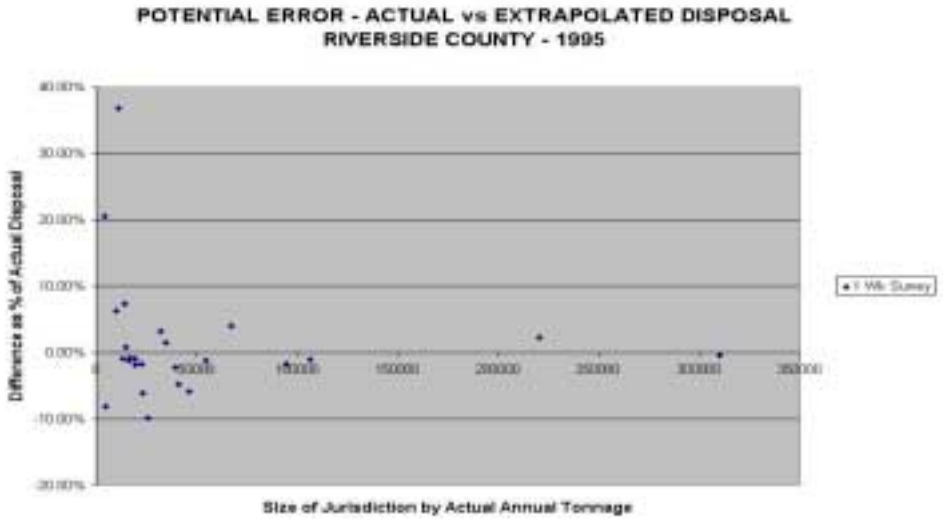

Maximized Residential Adjustment Factor
Base Year = 1990; Report Year = 1999
Number of Jurisdictions
120
110
100
90
80
70
60
50
40
30
20
10
0
0.79
0.86
0.93
1.00
1.07
1.14
1.21
1.28
1.35
1.42
1.49
1.56
1.63
1.70
1.77
1.84
1.91
1.98
2.05
2.12
2.19
2.26
2.33
Residential Adjustment Factor

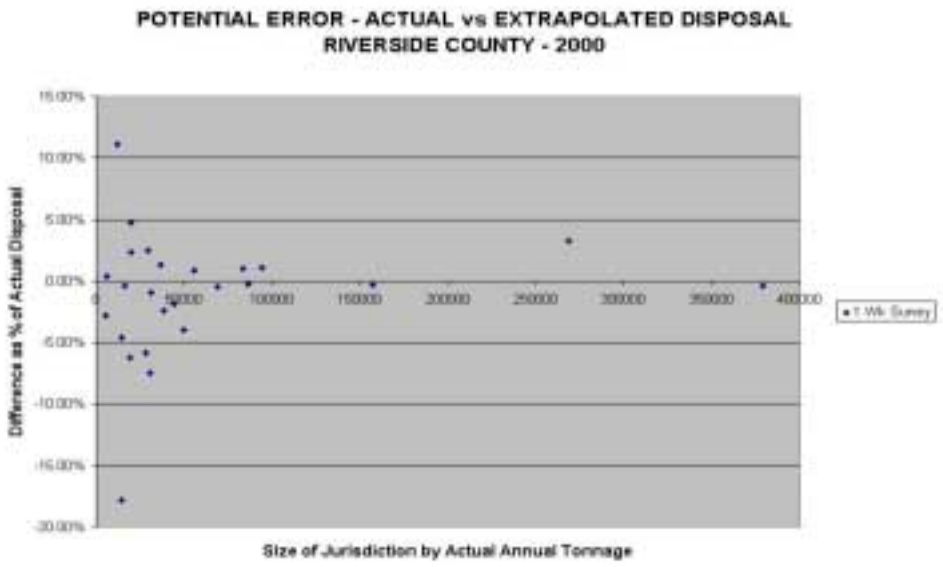

Maximized Non-Residential Adjustment Factor
Base Year = 1998, Report Year = 1999
Number of Jurisdictions
35
30
25
20
15
10
5
0
0.79
0.86
0.93
1.00
1.07
1.14
1.21
1.28
Non-Residential Adjustment Factor


Maximized Residential Adjustment Factor
Base Year = 1998, Report Year = 1999
Number of Jurisdictions
50
45
40
35
30
25
20
15
10
5
0
0.79
0.86
0.93
1.00
1.07
1.14
1.21
Residential Adjustment Factor

Does Jurisdiction Size Matter?

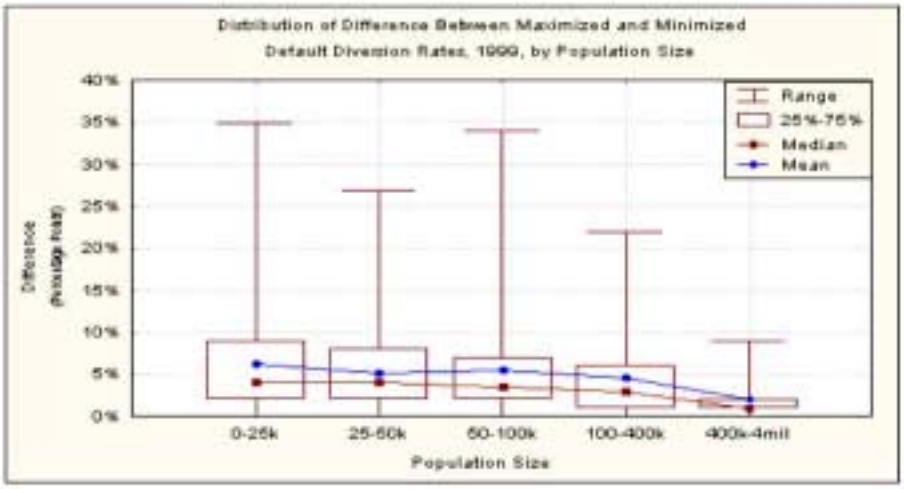
- Issue: Do the odds of Disposal Reporting System error increase as jurisdiction size decreases?





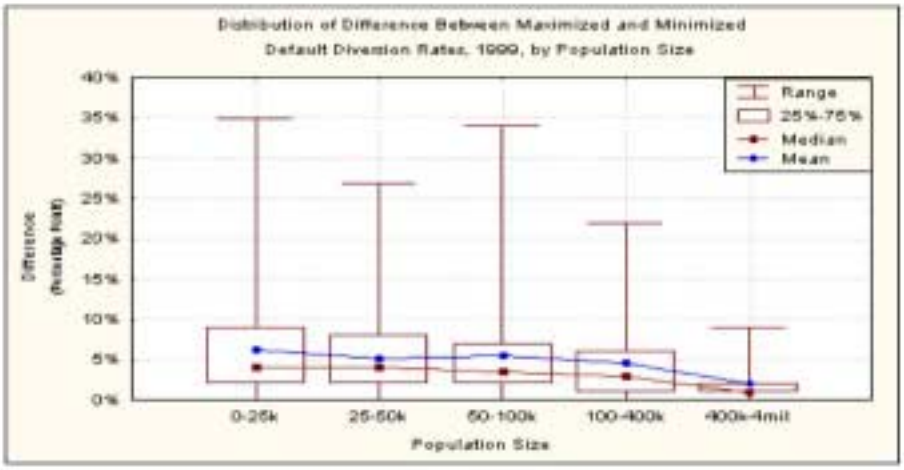
Does Jurisdiction Size Matter?

- The smaller the jurisdiction:
  - The greater the odds of Disposal Reporting System error
  - The greater the range of default diversion rates?



To Maximize Or Not To Maximize

- **Issue: Are the most representative adjustment factors the same as the factors that maximize the diversion rate?**
  - What is the difference between the maximized and minimized diversion rate estimates?
  - If there is a big difference between maximized and minimized, should we investigate further?



To Maximize Or Not To Maximize

- Since 1996 the tendency is to maximize
  - Issue: What adjustment factor measurement level is best: county or jurisdiction?
    - Measurement level use has changed over time
    - County level is a more accurate level for measuring the factor
    - Jurisdiction level data may be more representative if the jurisdiction is different from the county as a whole

Adjustment Factor Balanced Change

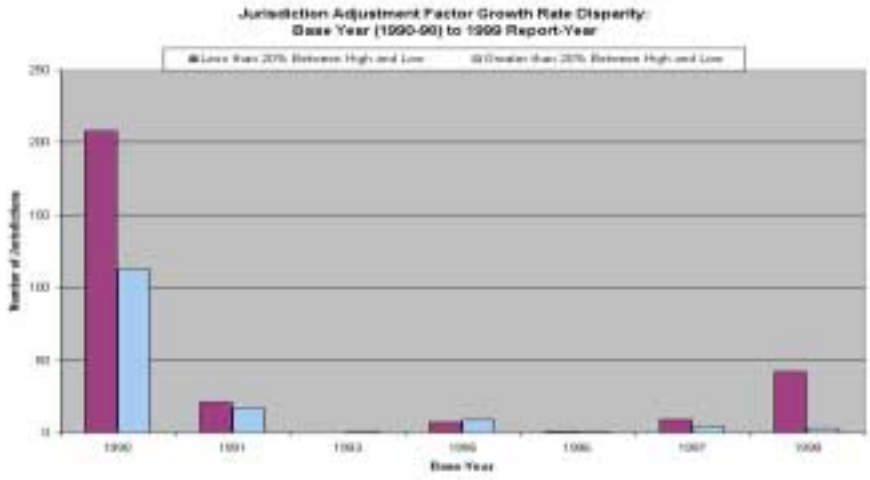
- Issues:
  - If base-year to report-year % change in population, employment, and CPI-adjusted taxable sales is not balanced, has the nature of solid waste production significantly changed since the base-year?
  - Should the "red flag" approach be used when change between factors is "unbalanced"?

Unbalanced Change Example
City of Dublin: 1990 - 1999

- Adjustment factor change:
  - Jurisdiction population = +24%
  - Countywide employment = +6%
  - Jurisdiction CPI-adjusted taxable sales = +42%
- Difference between maximum change (42%) and minimum change (6%) = 36%
- Therefore, change may be unbalanced

Unbalanced Change Example
City of Dublin: 1990 - 1999

- Two "red flag" scenarios:
  - Countywide employment % change is not representative of Dublin's employment % change
  - Countywide employment % change is representative of Dublin's employment % change; there was a fundamental shift in the nature of the production of Dublin's solid waste
- Considering Dublin's base-year age and default adjustment factor % change imbalance, it may be wise to establish a new base-year



Conclusions

1. Base-year age may be a factor in diversion rate estimate error
   - Adjustment Method accuracy not demonstrated for growth over 14%
   - Unbalanced change in adjustment factors may be more likely for jurisdictions with older base-years
   - Changes in nature of solid waste production should be considered

Conclusions

2. Jurisdiction size may be a factor in diversion rate estimate error
   - Disposal Reporting System data may have significant error for smaller jurisdictions
   - Difference between maximized and minimized diversion rates is greater for smaller jurisdictions

Conclusions

3. Maximized diversion rates should be further investigated if:
   - The difference between the maximized and minimized diversion rates is greater than 8-10%
   - Only countywide adjustment factors are used when jurisdiction factor growth rates are different from countywide

Conclusions

4. Unbalanced change in adjustment factors should be considered a "red flag"
   - Unbalanced change could indicate:
     - Significant change in the nature of the production of solid waste
     - County level factors do not reflect the jurisdiction's demographic and economic growth
   - Need further investigation to determine significance of balanced factors

1999 BOE ANNUAL REPORT TAXABLE SALES VS CIWMB TAXABLE SALES

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Alameda	Alameda	1990	Jurisdiction	651,012	57%	Jurisdiction	616,950	56%	-1%	N
Alameda-Unincorporated	Alameda	1990	County	20,672,287	64%	County	20,265,468	64%	0%	N
Albany	Alameda	1990	County	20,672,287	56%	County	20,265,468	56%	0%	N
Berkeley	Alameda	1990	County	20,672,287	40%	County	20,265,468	40%	0%	N
Dublin	Alameda	1990	Jurisdiction	909,137	33%	Jurisdiction	897,358	33%	0%	N
Emeryville	Alameda	1990	Jurisdiction	516,853	16%	Jurisdiction	524,240	16%	0%	N
Fremont	Alameda	1990	Jurisdiction	2,406,937	49%	Jurisdiction	2,331,215	48%	-1%	N
Hayward	Alameda	1990	County	20,672,287	40%	County	20,265,468	40%	0%	N
Livermore	Alameda	1990	Jurisdiction	1,158,536	38%	Jurisdiction	1,159,697	38%	0%	N
Newark	Alameda	1990	Jurisdiction	982,061	41%	Jurisdiction	989,251	41%	0%	N
Oakland	Alameda	1990	County	20,672,287	33%	County	20,265,468	33%	0%	N
Piedmont	Alameda	1990	County	20,672,287	60%	County	20,265,468	60%	0%	N
Pleasanton	Alameda	1990	Jurisdiction	1,647,247	24%	Jurisdiction	1,622,724	23%	-1%	N
San Leandro	Alameda	1990	County	20,672,287	54%	County	20,265,468	54%	0%	N
Union City	Alameda	1990	Jurisdiction	586,654	59%	Jurisdiction	575,763	59%	0%	N
Alpine-Unincorporated	Alpine	1990	County	23,239	51%	County	24,802	52%	1%	N
Amador County Integrated Solid Waste Management Agency	Amador	1990	Jurisdiction	287,313	60%	Jurisdiction	288,844	60%	0%	N
Butte County Regional Waste Management Authority	Butte	1997	County	1,896,734	19%	County	1,883,173	19%	0%	N
Chico	Butte	1995	Jurisdiction	1,024,205	48%	Jurisdiction	1,027,410	48%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Oroville	Butte	1995	County	1,896,734	35%	County	1,883,173	35%	0%	N
Angels Camp	Calaveras	1990	County	219,890	34%	County	219,802	34%	0%	N
Calaveras-Unincorporated	Calaveras	1990	Jurisdiction	139,012	36%	Jurisdiction	140,980	36%	0%	N
Colusa County Regional Agency	Colusa	1991	County	217,013	43%	County	214,868	43%	0%	N
Antioch	Contra Costa	1990	Jurisdiction	585,093	-19%	Jurisdiction	582,969	-19%	0%	N
Brentwood	Contra Costa	1990	Jurisdiction	151,789	-111%	Jurisdiction	153,190	-110%	1%	N
Clayton	Contra Costa	1990	Jurisdiction	36,978	17%	Jurisdiction	36,978	17%	0%	N
Concord	Contra Costa	1990	County	11,114,476	26%	County	11,178,631	26%	0%	N
Contra Costa-Unincorporated	Contra Costa	1990	County	11,114,476	20%	County	11,178,631	20%	0%	N
Danville	Contra Costa	1990	Jurisdiction	345,222	31%	Jurisdiction	340,528	30%	-1%	N
Lafayette	Contra Costa	1990	County	11,114,476	32%	County	11,178,631	32%	0%	N
Martinez	Contra Costa	1999	Jurisdiction	291,467	33%	County	11,178,631	33%	0%	Y
Moraga	Contra Costa	1990	County	11,114,476	48%	County	11,178,631	49%	1%	N
Orinda	Contra Costa	1990	County	11,114,476	44%	County	11,178,631	44%	0%	N
Pittsburg	Contra Costa	1998	Jurisdiction	469,195	68%	Jurisdiction	471,875	68%	0%	N
Pleasant Hill	Contra Costa	1990	County	11,114,476	19%	County	11,178,631	19%	0%	N
San Ramon	Contra Costa	1990	Jurisdiction	1,190,642	51%	Jurisdiction	1,300,641	53%	2%	N
Walnut Creek	Contra Costa	1990	Jurisdiction	1,485,968	44%	County	11,178,631	44%	0%	Y
West Contra Costa Integrated Waste Management Authority	Contra Costa	1990	County	11,114,476	32%	County	11,178,631	32%	0%	N
Del Norte Solid Waste Management Authority	Del Norte	1990	County	158,360	45%	Jurisdiction	126,391	45%	0%	Y
El Dorado-Unincorporated	El Dorado	1990	Jurisdiction	515,131	38%	Jurisdiction	513,986	38%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Placerville	El Dorado	1990	County	1,193,677	49%	County	1,198,710	49%	0%	N
South Lake Tahoe	El Dorado	1990	County	1,193,677	39%	County	1,198,710	39%	0%	N
Clovis	Fresno	1990	Jurisdiction	860,498	58%	Jurisdiction	854,327	58%	0%	N
Coalinga	Fresno	1997	County	7,771,284	41%	County	7,679,271	41%	0%	N
Firebaugh	Fresno	1997	County	7,771,284	53%	County	7,679,271	53%	0%	N
Fowler	Fresno	1990	Jurisdiction	43,706	85%	Jurisdiction	41,948	84%	-1%	N
Fresno	Fresno	1990	County	7,771,284	22%	County	7,679,271	22%	0%	N
Fresno-Unincorporated	Fresno	1990	County	7,771,284	38%	County	7,679,271	37%	-1%	N
Huron	Fresno	1990	County	7,771,284	15%	County	7,679,271	14%	-1%	N
Kerman	Fresno	1997	Jurisdiction	70,712	19%	Jurisdiction	81,682	24%	5%	N
Kingsburg	Fresno	1990	Jurisdiction	52,590	9%	Jurisdiction	54,349	10%	1%	N
Mendota	Fresno	1990	County	7,771,284	26%	County	7,679,271	26%	0%	N
Orange Cove	Fresno	1990	County	7,771,284	88%	County	7,679,271	88%	0%	N
Parlier	Fresno	1990	Jurisdiction	15,907	70%	Jurisdiction	16,253	71%	1%	N
Reedley	Fresno	1990	County	7,771,284	66%	County	7,679,271	65%	-1%	N
San Joaquin	Fresno	1990	County	7,771,284	-3%	County	7,679,271	-3%	0%	N
Sanger	Fresno	1990	County	7,771,284	49%	County	7,679,271	48%	-1%	N
Selma	Fresno	1990	Jurisdiction	272,849	21%	Jurisdiction	274,015	21%	0%	N
Glenn County Waste Management Regional Agency	Glenn	1990	County	215,702	49%	County	215,736	49%	0%	N
Arcata	Humboldt	1990	County	1,219,721	40%	County	1,210,859	39%	-1%	N
Blue Lake	Humboldt	1990	County	1,219,721	92%	County	1,210,859	92%	0%	N
Eureka	Humboldt	1990	County	1,219,721	20%	County	1,210,859	20%	0%	N
Ferndale	Humboldt	1990	Jurisdiction	10,572	46%	Jurisdiction	10,981	47%	1%	N
Fortuna	Humboldt	1990	Jurisdiction	96,257	4%	Jurisdiction	97,688	5%	1%	N
Humboldt-Unincorporated	Humboldt	1990	Jurisdiction	234,357	75%	Jurisdiction	237,311	75%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Rio Dell	Humboldt	1990	County	1,219,721	39%	County	1,210,859	39%	0%	N
Trinidad	Humboldt	1990	Jurisdiction	5,996	72%	Jurisdiction	5,796	72%	0%	N
Brawley	Imperial	1991	County	1,293,324	-11%	County	1,264,260	-12%	-1%	N
Calexico	Imperial	1991	Jurisdiction	300,112	6%	Jurisdiction	297,090	5%	-1%	N
Calipatria	Imperial	1991	County	1,293,324	37%	County	1,264,260	37%	0%	N
El Centro	Imperial	1991	Jurisdiction	471,979	27%	Jurisdiction	468,406	27%	0%	N
Holtville	Imperial	1991	County	1,293,324	21%	County	1,264,260	20%	-1%	N
Imperial	Imperial	1991	Jurisdiction	67,012	31%	Jurisdiction	62,581	29%	-2%	N
Imperial-Unincorporated	Imperial	1991	County	1,293,324	85%	County	1,264,260	85%	0%	N
Westmorland	Imperial	1991	Jurisdiction	9,757	-3%	Jurisdiction	9,539	-4%	-1%	N
Inyo Regional Waste Management Agency	Inyo	1991	County	240,111	41%	County	238,956	41%	0%	N
Arvin	Kern	1990	County	6,324,261	32%	County	6,346,995	32%	0%	N
Bakersfield	Kern	1990	Jurisdiction	3,196,732	36%	Jurisdiction	3,163,547	36%	0%	N
California City	Kern	1990	Jurisdiction	15,520	55%	Jurisdiction	15,159	54%	-1%	N
Delano	Kern	1990	County	6,324,261	32%	County	6,346,995	32%	0%	N
Kern-Unincorporated	Kern	1990	County	6,324,261	50%	County	6,346,995	50%	0%	N
Maricopa	Kern	1990	Jurisdiction	2,413	57%	Jurisdiction	2,290	56%	-1%	N
McFarland	Kern	1990	Jurisdiction	12,781	33%	Jurisdiction	13,381	34%	1%	N
Ridgecrest	Kern	1990	County	6,324,261	48%	County	6,346,995	49%	1%	N
Shafter	Kern	1996	Jurisdiction	110,943	61%	Jurisdiction	101,295	60%	-1%	N
Taft	Kern	1990	County	6,324,261	63%	County	6,346,995	63%	0%	N
Tehachapi	Kern	1990	Jurisdiction	66,415	84%	Jurisdiction	66,320	84%	0%	N
Wasco	Kern	1990	County	6,324,261	56%	County	6,346,995	56%	0%	N
Avenal	Kings	1990	County	800,312	-22%	County	788,063	-22%	0%	N
Kings Waste and Recycling Authority	Kings	1998	Jurisdiction	686,394	45%	Jurisdiction	678,141	45%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Clearlake	Lake	1990	County	383,524	-40%	County	373,567	-41%	-1%	N
Lakeport	Lake	1990	Jurisdiction	99,923	15%	Jurisdiction	97,526	14%	-1%	N
Lake-Unincorporated	Lake	1990	County	383,524	32%	County	373,567	31%	-1%	N
Lassen Regional Solid Waste Management Authority	Lassen	1990	Jurisdiction	162,048	54%	Jurisdiction	160,658	54%	0%	N
Agoura Hills	Los Angeles	1997	County	97,316,828	29%	County	96,666,597	29%	0%	N
Alhambra	Los Angeles	1990	Jurisdiction	960,593	12%	Jurisdiction	952,822	11%	-1%	N
Arcadia	Los Angeles	1990	Jurisdiction	583,705	24%	Jurisdiction	578,146	24%	0%	N
Artesia	Los Angeles	1990	County	97,316,828	20%	Jurisdiction	162,635	20%	0%	Y
Avalon	Los Angeles	1990	Jurisdiction	53,984	79%	Jurisdiction	52,123	78%	-1%	N
Azusa	Los Angeles	1995	County	97,316,828	32%	County	96,666,597	32%	0%	N
Baldwin Park	Los Angeles	1990	Jurisdiction	317,396	-13%	Jurisdiction	327,086	-12%	1%	N
Bell	Los Angeles	1990	County	97,316,828	31%	County	96,666,597	31%	0%	N
Bell Gardens	Los Angeles	1990	County	97,316,828	-17%	County	96,666,597	-17%	0%	N
Bellflower	Los Angeles	1990	County	97,316,828	60%	County	96,666,597	60%	0%	N
Beverly Hills	Los Angeles	1990	Jurisdiction	1,494,008	42%	Jurisdiction	1,476,482	42%	0%	N
Bradbury	Los Angeles	1990	County	97,316,828	74%	County	96,666,597	74%	0%	N
Burbank	Los Angeles	1990	Jurisdiction	1,676,891	60%	Jurisdiction	1,678,895	60%	0%	N
Calabasas	Los Angeles	1997	Jurisdiction	295,656	34%	Jurisdiction	310,960	35%	1%	N
Carson	Los Angeles	1997	Jurisdiction	1,559,120	71%	Jurisdiction	1,550,388	71%	0%	N
Cerritos	Los Angeles	1990	Jurisdiction	2,159,024	32%	Jurisdiction	2,214,904	32%	0%	N
Claremont	Los Angeles	1999	County	97,316,828	39%	County	96,666,597	39%	0%	N
Commerce	Los Angeles	1990	County	97,316,828	16%	County	96,666,597	15%	-1%	N
Compton	Los Angeles	1990	Jurisdiction	490,426	-48%	Jurisdiction	482,220	-49%	-1%	N
Covina	Los Angeles	1997	Jurisdiction	576,134	25%	Jurisdiction	576,477	25%	0%	N
Cudahy	Los Angeles	1990	Jurisdiction	97,377	62%	Jurisdiction	96,630	62%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Culver City	Los Angeles	1990	Jurisdiction	1,150,739	32%	Jurisdiction	1,124,832	31%	-1%	N
Diamond Bar	Los Angeles	1990	County	97,316,828	27%	County	96,666,597	27%	0%	N
Downey	Los Angeles	1990	Jurisdiction	1,069,203	58%	Jurisdiction	1,066,003	58%	0%	N
Duarte	Los Angeles	1990	Jurisdiction	274,603	10%	Jurisdiction	257,743	7%	-3%	N
El Monte	Los Angeles	1995	Jurisdiction	1,269,275	25%	Jurisdiction	1,252,443	24%	-1%	N
El Segundo	Los Angeles	1990	Jurisdiction	637,162	73%	Jurisdiction	648,058	73%	0%	N
Gardena	Los Angeles	1990	County	97,316,828	-81%	County	96,666,597	-82%	-1%	N
Glendale	Los Angeles	1989	Jurisdiction	2,224,118	48%	Jurisdiction	2,202,700	47%	-1%	N
Glendora	Los Angeles	1990	Jurisdiction	403,719	34%	Jurisdiction	404,722	34%	0%	N
Hawaiian Gardens	Los Angeles	1990	County	97,316,828	54%	County	96,666,597	54%	0%	N
Hawthorne	Los Angeles	1990	County	97,316,828	46%	County	96,666,597	46%	0%	N
Hermosa Beach	Los Angeles	1998	Jurisdiction	201,062	35%	Jurisdiction	200,459	35%	0%	N
Hidden Hills	Los Angeles	1995	Jurisdiction	2,114	37%	Jurisdiction	5,369	61%	24%	N
Huntington Park	Los Angeles	1990	County	97,316,828	46%	County	96,666,597	46%	0%	N
Industry	Los Angeles	1998	County	97,316,828	52%	County	96,666,597	52%	0%	N
Inglewood	Los Angeles	1990	County	97,316,828	51%	County	96,666,597	51%	0%	N
Irwindale	Los Angeles	1990	County	97,316,828	55%	County	96,666,597	55%	0%	N
La Canada Flintridge	Los Angeles	1990	County	97,316,828	-1%	County	96,666,597	-1%	0%	N
La Habra Heights	Los Angeles	1991	Jurisdiction	4,955	30%	Jurisdiction	5,216	31%	1%	N
La Mirada	Los Angeles	1995	Jurisdiction	629,426	22%	Jurisdiction	624,994	21%	-1%	N
La Puente	Los Angeles	1990	Jurisdiction	192,636	-56%	Jurisdiction	190,699	-57%	-1%	N
La Verne	Los Angeles	1990	Jurisdiction	221,467	-60%	Jurisdiction	224,271	-59%	1%	N
Lakewood	Los Angeles	1999	County	97,316,828	29%	County	96,666,597	29%	0%	N
Lancaster	Los Angeles	1990	County	97,316,828	51%	County	96,666,597	51%	0%	N
Lawndale	Los Angeles	1990	County	97,316,828	44%	County	96,666,597	44%	0%	N
Lomita	Los Angeles	1998	Jurisdiction	104,942	57%	Jurisdiction	105,753	57%	0%	N
Long Beach	Los Angeles	1998	Jurisdiction	2,823,556	32%	Jurisdiction	2,728,523	31%	-1%	N
Los Angeles	Los Angeles	1995	County	97,316,828	49%	County	96,666,597	49%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Los Angeles-Unincorporated	Los Angeles	1990	County	97,316,828	40%	County	96,666,597	40%	0%	N
Lynwood	Los Angeles	1990	County	97,316,828	-11%	County	96,666,597	-11%	0%	N
Malibu	Los Angeles	1995	Jurisdiction	152,328	18%	Jurisdiction	154,111	18%	0%	N
Manhattan Beach	Los Angeles	1998	Jurisdiction	591,910	33%	Jurisdiction	585,515	33%	0%	N
Maywood	Los Angeles	1990	County	97,316,828	51%	County	96,666,597	51%	0%	N
Monrovia	Los Angeles	1995	Jurisdiction	595,278	37%	Jurisdiction	593,013	37%	0%	N
Montebello	Los Angeles	1999	Jurisdiction	864,388	46%	County	96,666,597	46%	0%	Y
Monterey Park	Los Angeles	1990	County	97,316,828	24%	County	96,666,597	24%	0%	N
Norwalk	Los Angeles	1999	County	97,316,828	19%	County	96,666,597	18%	-1%	N
Palmdale	Los Angeles	1990	Jurisdiction	803,597	51%	Jurisdiction	796,724	51%	0%	N
Palos Verdes Estates	Los Angeles	1990	Jurisdiction	21,694	53%	Jurisdiction	21,010	52%	-1%	N
Paramount	Los Angeles	1998	County	97,316,828	35%	County	96,666,597	35%	0%	N
Pasadena	Los Angeles	1990	Jurisdiction	2,292,734	40%	Jurisdiction	2,338,150	40%	0%	N
Pico Rivera	Los Angeles	1990	County	97,316,828	-128%	County	96,666,597	-129%	-1%	N
Pomona	Los Angeles	1990	Jurisdiction	953,545	-23%	Jurisdiction	957,351	-23%	0%	N
Rancho Palos Verdes	Los Angeles	1990	County	97,316,828	11%	County	96,666,597	10%	-1%	N
Redondo Beach	Los Angeles	1990	County	97,316,828	20%	County	96,666,597	19%	-1%	N
Rolling Hills	Los Angeles	1990	County	97,316,828	21%	County	96,666,597	21%	0%	N
Rolling Hills Estates	Los Angeles	1990	County	97,316,828	72%	County	96,666,597	72%	0%	N
Rosemead	Los Angeles	1990	County	97,316,828	18%	County	96,666,597	18%	0%	N
San Dimas	Los Angeles	1998	County	97,316,828	51%	County	96,666,597	51%	0%	N
San Fernando	Los Angeles	1990	Jurisdiction	374,256	10%	Jurisdiction	379,779	10%	0%	N
San Gabriel	Los Angeles	1990	County	97,316,828	-88%	County	96,666,597	-89%	-1%	N
San Marino	Los Angeles	1990	County	97,316,828	17%	County	96,666,597	17%	0%	N
Santa Clarita	Los Angeles	1990	Jurisdiction	1,641,072	25%	Jurisdiction	1,632,226	25%	0%	N
Santa Fe Springs	Los Angeles	1998	County	97,316,828	70%	Jurisdiction	1,848,219	72%	2%	Y

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Santa Monica	Los Angeles	1995	Jurisdiction	2,076,607	43%	Jurisdiction	2,053,486	43%	0%	N
Sierra Madre	Los Angeles	1990	County	97,316,828	-12%	County	96,666,597	-13%	-1%	N
Signal Hill	Los Angeles	1990	Jurisdiction	711,207	16%	Jurisdiction	705,662	15%	-1%	N
South El Monte	Los Angeles	1998	Jurisdiction	292,709	64%	County	96,666,597	63%	-1%	Y
South Gate	Los Angeles	1998	Jurisdiction	518,830	41%	Jurisdiction	524,929	42%	1%	N
South Pasadena	Los Angeles	1990	County	97,316,828	23%	County	96,666,597	23%	0%	N
Temple City	Los Angeles	1998	County	97,316,828	46%	County	96,666,597	46%	0%	N
Torrance	Los Angeles	1990	Jurisdiction	3,189,413	-34%	Jurisdiction	3,168,395	-35%	-1%	N
Vernon	Los Angeles	1998	County	97,316,828	36%	Jurisdiction	432,706	38%	2%	Y
Walnut	Los Angeles	1999	Jurisdiction	117,412	37%	County	96,666,597	37%	0%	Y
West Covina	Los Angeles	1990	Jurisdiction	984,374	45%	Jurisdiction	978,999	45%	0%	N
West Hollywood	Los Angeles	1990	County	97,316,828	32%	County	96,666,597	32%	0%	N
Westlake Village	Los Angeles	1995	Jurisdiction	228,361	6%	Jurisdiction	230,348	6%	0%	N
Whittier	Los Angeles	1990	County	97,316,828	28%	County	96,666,597	27%	-1%	N
Chowchilla	Madera	1990	County	828,651	21%	County	811,603	20%	-1%	N
Madera	Madera	1990	Jurisdiction	360,596	22%	Jurisdiction	354,469	21%	-1%	N
Madera-Unincorporated	Madera	1990	County	828,651	46%	County	811,603	45%	-1%	N
Marin County Hazardous and Solid Waste Management Authority	Marin	1990	Jurisdiction	3,340,232	42%	County	3,668,620	42%	0%	Y
Mariposa-Unincorporated	Mariposa	1990	County	127,319	31%	County	126,651	31%	0%	N
Fort Bragg	Mendocino	1991	County	896,221	41%	County	882,374	41%	0%	N
Mendocino-Unincorporated	Mendocino	1991	County	896,221	16%	County	882,374	15%	-1%	N
Point Arena	Mendocino	1990	Jurisdiction	4,543	13%	Jurisdiction	4,426	13%	0%	N
Ukiah	Mendocino	1991	Jurisdiction	278,820	20%	Jurisdiction	278,127	20%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Willits	Mendocino	1991	County	896,221	18%	County	882,374	17%	-1%	N
Merced County Solid Waste Regional Agency	Merced	1990	County	1,592,118	42%	County	1,603,375	43%	1%	N
Alturas	Modoc	1998	Jurisdiction	31,725	42%	County	65,347	42%	0%	Y
Modoc-Unincorporated	Modoc	1998	County	61,857	34%	County	65,347	36%	2%	N
Mammoth Lakes	Mono	1991	County	177,835	32%	Jurisdiction	116,502	32%	0%	Y
Mono-Unincorporated	Mono	1991	County	177,835	56%	County	176,962	56%	0%	N
Carmel-by-the-Sea	Monterey	1990	County	4,280,676	42%	County	4,275,002	42%	0%	N
Del Rey Oaks	Monterey	1990	County	4,280,676	39%	County	4,275,002	39%	0%	N
Gonzales	Monterey	1990	County	4,280,676	-137%	County	4,275,002	-137%	0%	N
Greenfield	Monterey	1990	Jurisdiction	43,013	8%	Jurisdiction	43,411	9%	1%	N
King City	Monterey	1990	County	4,280,676	1%	County	4,275,002	1%	0%	N
Marina	Monterey	1990	County	4,280,676	58%	County	4,275,002	58%	0%	N
Monterey	Monterey	1998	County	4,280,676	60%	County	4,275,002	60%	0%	N
Monterey-Unincorporated	Monterey	1990	County	4,280,676	30%	County	4,275,002	30%	0%	N
Pacific Grove	Monterey	1990	County	4,280,676	40%	County	4,275,002	40%	0%	N
Salinas	Monterey	1990	Jurisdiction	1,562,014	19%	Jurisdiction	1,563,846	19%	0%	N
Sand City	Monterey	1990	Jurisdiction	199,991	37%	Jurisdiction	202,841	38%	1%	N
Seaside	Monterey	1990	Jurisdiction	369,448	51%	Jurisdiction	367,098	51%	0%	N
Soledad	Monterey	1990	Jurisdiction	29,410	52%	Jurisdiction	29,588	52%	0%	N
American Canyon	Napa	1990	County	1,707,907	-10%	County	1,706,512	-10%	0%	N
Napa	Napa	1990	County	1,707,907	32%	County	1,706,512	32%	0%	N
Napa-Unincorporated	Napa	1995	Jurisdiction	349,515	-34%	Jurisdiction	346,212	-35%	-1%	N
Upper Valley Waste Management Agency	Napa	1990	County	1,707,907	59%	County	1,706,512	59%	0%	N
Grass Valley	Nevada	1990	County	911,768	56%	County	913,740	56%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Nevada City	Nevada	1990	Jurisdiction	82,558	66%	Jurisdiction	88,383	67%	1%	N
Nevada-Unincorporated	Nevada	1990	County	911,768	41%	County	913,740	41%	0%	N
Truckee	Nevada	1995	County	911,768	30%	County	913,740	30%	0%	N
Anaheim	Orange	1990	County	40,366,090	50%	County	40,109,232	50%	0%	N
Brea	Orange	1990	Jurisdiction	1,204,386	32%	Jurisdiction	1,188,790	32%	0%	N
Buena Park	Orange	1990	County	40,366,090	44%	County	40,109,232	44%	0%	N
Costa Mesa	Orange	1998	County	40,366,090	45%	County	40,109,232	45%	0%	N
Cypress	Orange	1990	Jurisdiction	738,189	57%	Jurisdiction	748,188	58%	1%	N
Dana Point	Orange	1998	Jurisdiction	285,984	41%	Jurisdiction	284,940	41%	0%	N
Fountain Valley	Orange	1998	County	40,366,090	47%	County	40,109,232	47%	0%	N
Fullerton	Orange	1990	County	40,366,090	58%	County	40,109,232	57%	-1%	N
Garden Grove	Orange	1990	County	40,366,090	55%	County	40,109,232	55%	0%	N
Huntington Beach	Orange	1998	Jurisdiction	2,043,221	65%	Jurisdiction	2,041,595	65%	0%	N
Irvine	Orange	1998	Jurisdiction	3,617,140	37%	Jurisdiction	3,633,843	37%	0%	N
La Habra	Orange	1990	County	40,366,090	41%	County	40,109,232	41%	0%	N
La Palma	Orange	1990	Jurisdiction	229,072	62%	Jurisdiction	233,931	62%	0%	N
Laguna Beach	Orange	1998	Jurisdiction	271,143	49%	Jurisdiction	266,337	49%	0%	N
Laguna Hills	Orange	1990	County	40,366,090	22%	County	40,109,232	22%	0%	N
Laguna Niguel	Orange	1990	Jurisdiction	603,807	36%	Jurisdiction	617,868	37%	1%	N
Lake Forest	Orange	1998	Jurisdiction	649,840	68%	Jurisdiction	637,506	68%	0%	N
Los Alamitos	Orange	1990	County	40,366,090	32%	County	40,109,232	32%	0%	N
Mission Viejo	Orange	1998	Jurisdiction	1,012,282	41%	County	40,109,232	40%	-1%	Y
Newport Beach	Orange	1990	Jurisdiction	1,641,782	47%	Jurisdiction	1,629,437	47%	0%	N
Orange	Orange	1990	County	40,366,090	35%	County	40,109,232	35%	0%	N
Orange-Unincorporated	Orange	1990	County	40,366,090	18%	County	40,109,232	18%	0%	N
Placentia	Orange	1990	Jurisdiction	400,418	59%	Jurisdiction	403,133	59%	0%	N
San Clemente	Orange	1998	Jurisdiction	355,020	40%	Jurisdiction	344,518	39%	-1%	N
San Juan Capistrano	Orange	1998	Jurisdiction	506,742	45%	Jurisdiction	502,136	45%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Santa Ana	Orange	1998	County	40,366,090	57%	County	40,109,232	56%	-1%	N
Seal Beach	Orange	1990	County	40,366,090	49%	County	40,109,232	49%	0%	N
Stanton	Orange	1990	County	40,366,090	47%	County	40,109,232	47%	0%	N
Tustin	Orange	1990	Jurisdiction	1,479,567	40%	Jurisdiction	1,465,951	40%	0%	N
Villa Park	Orange	1990	County	40,366,090	67%	County	40,109,232	67%	0%	N
Westminster	Orange	1998	Jurisdiction	1,166,518	59%	Jurisdiction	1,164,873	59%	0%	N
Yorba Linda	Orange	1990	Jurisdiction	426,371	64%	Jurisdiction	430,663	64%	0%	N
Auburn	Placer	1990	County	4,047,530	46%	County	4,080,981	46%	0%	N
Colfax	Placer	1999	County	4,047,530	50%	County	4,080,981	50%	0%	N
Lincoln	Placer	1990	County	4,047,530	34%	County	4,080,981	34%	0%	N
Loomis	Placer	1997	Jurisdiction	67,170	48%	Jurisdiction	64,970	47%	-1%	N
Placer-Unincorporated	Placer	1990	County	4,047,530	38%	County	4,080,981	38%	0%	N
Rocklin	Placer	1990	Jurisdiction	326,413	32%	Jurisdiction	330,449	33%	1%	N
Roseville	Placer	1990	Jurisdiction	2,012,940	16%	Jurisdiction	2,037,302	16%	0%	N
Plumas-Unincorporated	Plumas	1990	Jurisdiction	116,971	36%	Jurisdiction	118,882	36%	0%	N
Portola	Plumas	1990	County	168,147	-20%	County	167,559	-20%	0%	N
Banning	Riverside	1990	County	15,076,945	42%	County	15,072,177	42%	0%	N
Beaumont	Riverside	1990	County	15,076,945	37%	County	15,072,177	37%	0%	N
Blythe	Riverside	1990	County	15,076,945	12%	County	15,072,177	12%	0%	N
Calimesa	Riverside	1990	County	15,076,945	38%	County	15,072,177	38%	0%	N
Canyon Lake	Riverside	1990	County	15,076,945	52%	County	15,072,177	52%	0%	N
Cathedral City	Riverside	1990	County	15,076,945	29%	County	15,072,177	29%	0%	N
Coachella	Riverside	1990	County	15,076,945	57%	County	15,072,177	57%	0%	N
Corona	Riverside	1990	Jurisdiction	1,503,069	37%	Jurisdiction	1,500,784	37%	0%	N
Desert Hot Springs	Riverside	1990	County	15,076,945	15%	County	15,072,177	15%	0%	N
Hemet	Riverside	1990	Jurisdiction	599,281	58%	Jurisdiction	619,786	59%	1%	N
Indian Wells	Riverside	1990	County	15,076,945	36%	County	15,072,177	36%	0%	N
Indio	Riverside	1990	County	15,076,945	48%	County	15,072,177	48%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
La Quinta	Riverside	1990	Jurisdiction	240,453	44%	Jurisdiction	234,372	43%	-1%	N
Lake Elsinore	Riverside	1990	Jurisdiction	324,924	41%	Jurisdiction	326,491	41%	0%	N
Moreno Valley	Riverside	1990	Jurisdiction	704,546	48%	Jurisdiction	711,018	48%	0%	N
Murrieta	Riverside	1990	County	15,076,945	39%	County	15,072,177	39%	0%	N
Norco	Riverside	1990	Jurisdiction	347,775	58%	Jurisdiction	344,614	58%	0%	N
Palm Desert	Riverside	1990	Jurisdiction	1,098,211	52%	Jurisdiction	1,137,393	52%	0%	N
Palm Springs	Riverside	1990	County	15,076,945	50%	County	15,072,177	50%	0%	N
Perris	Riverside	1990	Jurisdiction	264,810	46%	County	15,072,177	45%	-1%	Y
Rancho Mirage	Riverside	1990	Jurisdiction	288,577	47%	Jurisdiction	284,297	46%	-1%	N
Riverside	Riverside	1990	County	15,076,945	59%	County	15,072,177	59%	0%	N
Riverside-Unincorporated	Riverside	1990	County	15,076,945	48%	County	15,072,177	48%	0%	N
San Jacinto	Riverside	1990	County	15,076,945	53%	County	15,072,177	53%	0%	N
Temecula	Riverside	1990	Jurisdiction	1,123,041	46%	Jurisdiction	1,082,625	45%	-1%	N
Folsom	Sacramento	1990	Jurisdiction	797,049	37%	Jurisdiction	787,081	37%	0%	N
Galt	Sacramento	1998	Jurisdiction	70,049	65%	Jurisdiction	68,663	64%	-1%	N
Isleton	Sacramento	1990	County	14,979,393	41%	County	14,820,652	41%	0%	N
Sacramento	Sacramento	1990	County	14,979,393	39%	County	14,820,652	39%	0%	N
Sacramento County/City of Citrus Heights Regional Agency	Sacramento	1990	County	14,979,393	31%	County	14,820,652	31%	0%	N
San Benito County Integrated Waste Management Regional Agency	San Benito	1990	Jurisdiction	369,984	10%	Jurisdiction	373,523	10%	0%	N
Adelanto	San Bernardino	1990	Jurisdiction	56,795	-78%	Jurisdiction	60,447	-74%	4%	N
Apple Valley	San Bernardino	1990	Jurisdiction	186,092	39%	Jurisdiction	183,558	39%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Barstow	San Bernardino	1990	County	16,787,378	53%	County	16,715,220	53%	0%	N
Big Bear Lake	San Bernardino	1990	County	16,787,378	-51%	County	16,715,220	-51%	0%	N
Chino	San Bernardino	1990	Jurisdiction	975,195	49%	Jurisdiction	958,452	48%	-1%	N
Chino Hills	San Bernardino	1991	County	16,787,378	35%	County	16,715,220	35%	0%	N
Colton	San Bernardino	1990	County	16,787,378	21%	County	16,715,220	21%	0%	N
Fontana	San Bernardino	1990	Jurisdiction	928,400	33%	Jurisdiction	932,207	34%	1%	N
Grand Terrace	San Bernardino	1990	County	16,787,378	53%	County	16,715,220	53%	0%	N
Hesperia	San Bernardino	1990	County	16,787,378	39%	County	16,715,220	39%	0%	N
Highland	San Bernardino	1990	County	16,787,378	34%	County	16,715,220	34%	0%	N
Loma Linda	San Bernardino	1990	Jurisdiction	200,981	34%	Jurisdiction	193,725	32%	-2%	N
Montclair	San Bernardino	1990	County	16,787,378	37%	County	16,715,220	37%	0%	N
Needles	San Bernardino	1990	County	16,787,378	28%	County	16,715,220	28%	0%	N
Ontario	San Bernardino	1990	Jurisdiction	2,886,868	26%	Jurisdiction	2,880,840	26%	0%	N
Rancho Cucamonga	San Bernardino	1990	Jurisdiction	1,111,610	44%	Jurisdiction	1,143,608	45%	1%	N
Redlands	San Bernardino	1990	County	16,787,378	42%	County	16,715,220	42%	0%	N
Rialto	San Bernardino	1990	Jurisdiction	580,650	55%	Jurisdiction	562,489	55%	0%	N
San Bernardino	San Bernardino	1990	County	16,787,378	46%	County	16,715,220	46%	0%	N
San Bernardino-Unincorporated	San Bernardino	1990	County	16,787,378	41%	County	16,715,220	41%	0%	N
Twentynine Palms	San Bernardino	1990	County	16,787,378	49%	County	16,715,220	49%	0%	N
Upland	San Bernardino	1990	County	16,787,378	38%	County	16,715,220	38%	0%	N
Victorville	San Bernardino	1990	County	16,787,378	24%	County	16,715,220	24%	0%	N
Yucaipa	San Bernardino	1990	County	16,787,378	41%	County	16,715,220	41%	0%	N
Yucca Valley	San Bernardino	1990	County	16,787,378	66%	County	16,715,220	66%	0%	N
Carlsbad	San Diego	1990	Jurisdiction	1,597,275	42%	Jurisdiction	1,543,838	41%	-1%	N
Chula Vista	San Diego	1990	County	32,752,405	36%	County	32,489,768	36%	0%	N
Coronado	San Diego	1990	County	32,752,405	51%	Jurisdiction	162,866	51%	0%	Y
Del Mar	San Diego	1990	County	32,752,405	24%	County	32,489,768	24%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
El Cajon	San Diego	1990	County	32,752,405	63%	County	32,489,768	63%	0%	N
Encinitas	San Diego	1990	Jurisdiction	741,283	47%	Jurisdiction	736,447	47%	0%	N
Escondido	San Diego	1990	County	32,752,405	43%	County	32,489,768	43%	0%	N
Imperial Beach	San Diego	1990	County	32,752,405	44%	County	32,489,768	44%	0%	N
La Mesa	San Diego	1990	County	32,752,405	42%	County	32,489,768	42%	0%	N
Lemon Grove	San Diego	1990	Jurisdiction	316,733	14%	Jurisdiction	318,643	15%	1%	N
National City	San Diego	1990	County	32,752,405	47%	County	32,489,768	47%	0%	N
Oceanside	San Diego	1990	County	32,752,405	47%	County	32,489,768	47%	0%	N
Poway	San Diego	1990	Jurisdiction	576,820	53%	Jurisdiction	585,292	53%	0%	N
San Diego	San Diego	1991	County	32,752,405	46%	County	32,489,768	45%	-1%	N
San Diego-Unincorporated	San Diego	1990	Jurisdiction	1,485,069	48%	Jurisdiction	1,476,706	48%	0%	N
San Marcos	San Diego	1990	County	32,752,405	44%	County	32,489,768	44%	0%	N
Santee	San Diego	1990	County	32,752,405	35%	County	32,489,768	35%	0%	N
Solana Beach	San Diego	1990	Jurisdiction	183,451	47%	Jurisdiction	183,156	47%	0%	N
Vista	San Diego	1990	Jurisdiction	770,663	42%	Jurisdiction	753,938	42%	0%	N
San Francisco	San Francisco	1990	County	12,336,761	33%	County	12,123,920	32%	-1%	N
Escalon	San Joaquin	1990	Jurisdiction	52,329	6%	Jurisdiction	50,809	5%	-1%	N
Lathrop	San Joaquin	1998	Jurisdiction	108,955	72%	Jurisdiction	107,067	70%	-2%	N
Lodi	San Joaquin	1990	County	5,761,960	30%	County	5,674,137	30%	0%	N
Manteca	San Joaquin	1990	Jurisdiction	431,740	18%	Jurisdiction	428,719	18%	0%	N
Ripon	San Joaquin	1990	Jurisdiction	99,380	73%	Jurisdiction	99,504	73%	0%	N
San Joaquin-Unincorporated	San Joaquin	1990	Jurisdiction	955,148	35%	Jurisdiction	938,605	34%	-1%	N
Stockton	San Joaquin	1990	County	5,761,960	16%	County	5,674,137	15%	-1%	N
Tracy	San Joaquin	1990	Jurisdiction	512,618	30%	Jurisdiction	508,520	30%	0%	N
El Paso De Robles	San Luis Obispo	1990	Jurisdiction	381,779	28%	Jurisdiction	382,833	28%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
San Luis Obispo County Integrated Waste Management Authority	San Luis Obispo	1998	County	2,598,180	51%	Jurisdiction	1,954,895	51%	0%	Y
Atherton	San Mateo	1997	Jurisdiction	34,379	27%	Jurisdiction	36,103	29%	2%	N
Belmont	San Mateo	1991	Jurisdiction	287,498	50%	Jurisdiction	263,494	48%	-2%	N
Brisbane	San Mateo	1990	County	12,130,051	4%	County	11,990,528	3%	-1%	N
Burlingame	San Mateo	1991	Jurisdiction	856,828	45%	Jurisdiction	869,164	45%	0%	N
Colma	San Mateo	1998	Jurisdiction	735,637	52%	Jurisdiction	718,957	51%	-1%	N
Daly City	San Mateo	1991	County	12,130,051	8%	County	11,990,528	7%	-1%	N
East Palo Alto	San Mateo	1995	Jurisdiction	61,663	49%	Jurisdiction	57,635	47%	-2%	N
Foster City	San Mateo	1991	Jurisdiction	414,618	40%	Jurisdiction	378,350	37%	-3%	N
Half Moon Bay	San Mateo	1991	Jurisdiction	123,822	11%	Jurisdiction	121,135	10%	-1%	N
Hillsborough	San Mateo	1991	County	12,130,051	0%	County	11,990,528	0%	0%	N
Menlo Park	San Mateo	1991	Jurisdiction	815,459	41%	Jurisdiction	793,596	40%	-1%	N
Millbrae	San Mateo	1991	County	12,130,051	49%	County	11,990,528	49%	0%	N
Pacifica	San Mateo	1991	County	12,130,051	26%	County	11,990,528	26%	0%	N
Portola Valley	San Mateo	1991	County	12,130,051	-43%	County	11,990,528	-43%	0%	N
Redwood City	San Mateo	1997	Jurisdiction	1,572,666	44%	Jurisdiction	1,553,005	44%	0%	N
San Bruno	San Mateo	1990	County	12,130,051	46%	County	11,990,528	46%	0%	N
San Carlos	San Mateo	1991	Jurisdiction	553,228	39%	Jurisdiction	541,153	39%	0%	N
San Mateo	San Mateo	1991	County	12,130,051	35%	County	11,990,528	34%	-1%	N
San Mateo-Unincorporated	San Mateo	1991	County	12,130,051	26%	County	11,990,528	25%	-1%	N
South San Francisco	San Mateo	1990	County	12,130,051	36%	County	11,990,528	35%	-1%	N
Woodside	San Mateo	1991	Jurisdiction	34,715	-131%	Jurisdiction	33,940	-134%	-3%	N
Buellton	Santa Barbara	1995	Jurisdiction	113,375	68%	Jurisdiction	114,000	68%	0%	N
Carpinteria	Santa Barbara	1990	Jurisdiction	113,476	60%	Jurisdiction	114,653	60%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Guadalupe	Santa Barbara	1990	County	4,426,532	36%	County	4,388,594	36%	0%	N
Lompoc	Santa Barbara	1990	Jurisdiction	253,891	54%	Jurisdiction	253,042	54%	0%	N
Santa Barbara	Santa Barbara	1998	County	4,426,532	41%	County	4,388,594	41%	0%	N
Santa Barbara-Unincorporated	Santa Barbara	1990	County	4,426,532	41%	County	4,388,594	41%	0%	N
Santa Maria	Santa Barbara	1990	Jurisdiction	1,048,609	44%	Jurisdiction	1,049,507	44%	0%	N
Solvang	Santa Barbara	1990	County	4,426,532	47%	County	4,388,594	47%	0%	N
Campbell	Santa Clara	1991	County	30,348,644	42%	County	30,004,682	41%	-1%	N
Cupertino	Santa Clara	1990	County	30,348,644	33%	Jurisdiction	1,018,206	34%	1%	Y
Gilroy	Santa Clara	1990	Jurisdiction	771,062	24%	Jurisdiction	765,255	24%	0%	N
Los Altos	Santa Clara	1990	County	30,348,644	42%	County	30,004,682	41%	-1%	N
Los Altos Hills	Santa Clara	1990	County	30,348,644	43%	County	30,004,682	43%	0%	N
Los Gatos	Santa Clara	1991	Jurisdiction	601,314	47%	Jurisdiction	578,891	46%	-1%	N
Milpitas	Santa Clara	1990	Jurisdiction	1,333,503	50%	Jurisdiction	1,344,035	51%	1%	N
Monte Sereno	Santa Clara	1991	Jurisdiction	2,395	58%	Jurisdiction	3,119	63%	5%	N
Morgan Hill	Santa Clara	1990	Jurisdiction	376,563	44%	Jurisdiction	378,052	45%	1%	N
Mountain View	Santa Clara	1990	County	30,348,644	47%	County	30,004,682	47%	0%	N
Palo Alto	Santa Clara	1996	Jurisdiction	1,878,915	59%	Jurisdiction	1,852,028	59%	0%	N
San Jose	Santa Clara	1990	County	30,348,644	46%	Jurisdiction	11,360,280	46%	0%	Y
Santa Clara	Santa Clara	1990	County	30,348,644	38%	County	30,004,682	38%	0%	N
Santa Clara-Unincorporated	Santa Clara	1990	County	30,348,644	46%	County	30,004,682	46%	0%	N
Saratoga	Santa Clara	1991	County	30,348,644	56%	County	30,004,682	55%	-1%	N
Sunnyvale	Santa Clara	1990	County	30,348,644	55%	County	30,004,682	55%	0%	N
Capitola	Santa Cruz	1999	County	2,624,632	42%	County	2,604,342	42%	0%	N
Santa Cruz	Santa Cruz	1990	Jurisdiction	725,287	46%	Jurisdiction	717,494	45%	-1%	N
Santa Cruz-Unincorporated	Santa Cruz	1990	Jurisdiction	649,117	21%	Jurisdiction	644,028	21%	0%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Scotts Valley	Santa Cruz	1990	County	2,624,632	59%	County	2,604,342	59%	0%	N
Watsonville	Santa Cruz	1990	County	2,624,632	33%	Jurisdiction	406,511	33%	0%	Y
Redding	Shasta	1990	Jurisdiction	1,327,370	28%	Jurisdiction	1,319,059	28%	0%	N
Shasta County Waste Management Agency	Shasta	1990	County	1,852,112	62%	County	1,844,787	62%	0%	N
Sierra County Regional Agency	Sierra	1991	County	19,996	25%	Jurisdiction	13,889	29%	4%	Y
Siskiyou County Integrated Solid Waste Management Regional Agency	Siskiyou	1990	County	355,845	44%	County	351,431	44%	0%	N
Benicia	Solano	1998	Jurisdiction	278,054	57%	County	3,853,388	56%	-1%	Y
Dixon	Solano	1998	County	3,897,029	61%	County	3,853,388	61%	0%	N
Fairfield	Solano	1990	County	3,897,029	32%	County	3,853,388	31%	-1%	N
Rio Vista	Solano	1998	County	3,897,029	72%	County	3,853,388	72%	0%	N
Solano-Unincorporated	Solano	1998	County	3,897,029	52%	Jurisdiction	140,078	52%	0%	Y
Suisun City	Solano	1998	County	3,897,029	66%	County	3,853,388	65%	-1%	N
Vacaville	Solano	1998	Jurisdiction	842,647	54%	Jurisdiction	838,959	54%	0%	N
Vallejo	Solano	1998	County	3,897,029	46%	County	3,853,388	46%	0%	N
Sonoma County Waste Management Agency	Sonoma	1990	County	6,017,754	38%	County	5,977,901	37%	-1%	N
Ceres	Stanislaus	1990	Jurisdiction	297,388	29%	Jurisdiction	298,331	29%	0%	N
Hughson	Stanislaus	1990	County	4,658,971	11%	County	4,621,720	11%	0%	N
Modesto	Stanislaus	1990	County	4,658,971	9%	County	4,621,720	9%	0%	N
Newman	Stanislaus	1990	County	4,658,971	22%	County	4,621,720	21%	-1%	N
Oakdale	Stanislaus	1990	Jurisdiction	211,976	-5%	Jurisdiction	210,052	-6%	-1%	N
Patterson	Stanislaus	1990	Jurisdiction	62,848	14%	Jurisdiction	61,792	13%	-1%	N
Riverbank	Stanislaus	1990	Jurisdiction	56,446	19%	Jurisdiction	57,540	20%	1%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Stanislaus-Unincorporated	Stanislaus	1990	Jurisdiction	1,006,388	65%	Jurisdiction	977,715	65%	0%	N
Turlock	Stanislaus	1990	Jurisdiction	570,123	35%	Jurisdiction	566,628	35%	0%	N
Waterford	Stanislaus	1990	Jurisdiction	20,550	38%	Jurisdiction	19,378	37%	-1%	N
Tehama County Sanitary Landfill Regional Agency	Tehama	1998	Jurisdiction	394,178	46%	Jurisdiction	395,666	46%	0%	N
Trinity-Unincorporated	Trinity	1993	County	63,134	66%	County	64,173	66%	0%	N
Consolidated Waste Management Authority	Tulare	1997	Jurisdiction	2,217,695	50%	Jurisdiction	2,212,909	50%	0%	N
Exeter	Tulare	1990	County	3,030,137	12%	County	3,012,209	12%	0%	N
Farmersville	Tulare	1990	Jurisdiction	25,697	28%	Jurisdiction	23,722	26%	-2%	N
Tulare-Unincorporated	Tulare	1997	County	3,030,137	40%	County	3,012,209	40%	0%	N
Woodlake	Tulare	1998	Jurisdiction	17,450	47%	Jurisdiction	16,770	47%	0%	N
Sonora	Tuolumne	1990	Jurisdiction	174,487	60%	Jurisdiction	175,956	60%	0%	N
Tuolumne-Unincorporated	Tuolumne	1990	County	455,906	46%	County	457,824	46%	0%	N
Camarillo	Ventura	1990	Jurisdiction	678,080	36%	Jurisdiction	683,488	36%	0%	N
Fillmore	Ventura	1990	County	8,339,182	34%	County	8,278,847	34%	0%	N
Moorpark	Ventura	1990	Jurisdiction	149,723	33%	Jurisdiction	155,626	34%	1%	N
Ojai	Ventura	1990	County	8,339,182	10%	County	8,278,847	10%	0%	N
Oxnard	Ventura	1998	Jurisdiction	1,565,360	70%	Jurisdiction	1,586,504	70%	0%	N
Port Hueneme	Ventura	1990	County	8,339,182	13%	County	8,278,847	13%	0%	N
San Buenaventura	Ventura	1998	County	8,339,182	59%	County	8,278,847	58%	-1%	N
Santa Paula	Ventura	1990	County	8,339,182	23%	County	8,278,847	23%	0%	N
Simi Valley	Ventura	1990	Jurisdiction	933,700	44%	Jurisdiction	923,300	44%	0%	N
Thousand Oaks	Ventura	1990	Jurisdiction	1,952,283	66%	Jurisdiction	1,936,627	66%	0%	N
Ventura-Unincorporated	Ventura	1995	Jurisdiction	361,830	31%	Jurisdiction	368,128	32%	1%	N

			BOE Annual Report Taxable Sales				CIWMB Taxable Sales Estimate			
Jurisdiction	**County**	**Base Year**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Default Measure Level**	**$ Amount (x1000)**	**Default Diversion Rate**	**Diversion Rate Difference**	**Different Measure Level?**
Davis	Yolo	1990	Jurisdiction	347,903	44%	Jurisdiction	345,094	43%	-1%	N
West Sacramento	Yolo	1990	Jurisdiction	758,307	42%	Jurisdiction	735,458	41%	-1%	N
Winters	Yolo	1990	County	2,125,393	26%	County	2,084,648	25%	-1%	N
Woodland	Yolo	1990	County	2,125,393	43%	County	2,084,648	42%	-1%	N
Yolo-Unincorporated	Yolo	1990	County	2,125,393	36%	County	2,084,648	36%	0%	N
Yuba/Sutter Regional Waste Management Authority	Yuba/Sutter	1990	County	1,202,386	26%	County	1,192,712	26%	0%	N

Meeting 3

HOW DOES CHANGING THE WEIGHTING OF THE POPULATION FACTOR IN THE RESIDENTIAL PORTION OF THE ADJUSTMENT METHOD FORMULA AFFECT 1999 DIVERSION RATE ESTIMATES?

A SB 2202 Adjustment Method Working Group Discussion Paper

May 11, 2001

Introduction

An issue identified at both the March 6th and April 11th Adjustment Method Working Group (AMWG) meetings concerned the appropriate weighting of the population factor in the Residential Adjustment Factor (RAF) portion of the Adjustment Method (AM) formula. In this discussion, we will alter the weighting of the population factor, and examine the resulting estimated maximum diversion rates calculated. To examine these changes, we will make two comparisons. First, we will use the Adjustment Method formula with zero or no population weighting to calculate the estimated maximum diversion rates. These results will be compared to the default estimated maximum diversion rates, which uses a fifty (50) percent population weighting. Next, we will use the Adjustment Method formula with one hundred (100) percent population weighting to calculate the estimated maximum diversion rates. Again, these results will be compared to the default, fifty (50) percent weighting.

This changing of the population factor weighting is not meant to be a rigorous or absolute examination of the accuracy of the current weighting. To determine the correct weighting of population, the Adjustment Method formula must be statistically analyzed. The goal of this discussion paper is to examine whether changing the weighting of the population factor has an effect on calculated diversion rates. If any of these changes results in significantly different diversion rates for a substantial number of jurisdictions, then it should be determined whether statistical analysis (regression analysis) of the population weighting is feasible with currently available data.

Background

The Board's AM was developed per statutory requirements to establish a standard methodology to estimate future year generation tonnage. This methodology was developed with the guidance of a working group that examined many factors related to the rate of waste generation. After extensive statistical analysis, the adjustment factors selected are Labor Force Employment, population, and Consumer Price Index (CPI)-adjusted taxable sales. These factors are used in the diversion rate measurement calculation that adjusts base-year generation tonnage for changes in population and economic conditions between base-year and report-year to estimate report-year generation tonnage. Estimated report-year generation is then compared to report-year disposal tonnage to determine disposal and diversion rates. The Adjustment Formula appears as follows:
[Estimated Reporting Year Generation] =

[Base Year Residential Waste Generation Tons] x [RAF] +

[Base Year Non-Residential Waste Generation Tons] x [NRAF]

The residential Adjustment Factor [RAF] is computed as follows:

[RAF] = [(PR/PB + {ER/EB + (CB/CR x TR/TB)}/2] / 2

While the non-residential factor [NRAF] is:

[NRAF] = [ER/EB + (CB/CR x TR/TB)] / 2

The key to the abbreviations used in the RAF and NRAF equations are:

PR = Reporting Year Population	PB = Base Year Population
ER = Reporting Year Employment	EB = Base Year Employment
CR = Reporting Year Consumer Pric	CB = Base Year Consumer Pric
TR = Reporting Year Taxable Sales	TB = Base Year Taxable Sales

Since the population factor is present in the RAF only, this is the part of the Adjustment Method formula that will vary for our comparisons. In the default RAF equation, PR/PB (appearing in bold in the following equation) represents the ratio of report-year population to base-year population.

[RAF] = **[(PR/PB** + {ER/EB + (CB/CR x TR/TB)}/2] / 2

To simplify this equation, notice that components in the second part of the equation (appearing in bold), are equivalent to the NRAF, as defined previously.

[RAF] = [(PR/PB + **{ER/EB + (CB/CR x TR/TB)}/2**] / 2

Equation for [NRAF] = [ER/EB + (CB/CR x TR/TB)] / 2

To simplify the RAF equation,

[RAF] = [(PR/PB + NRAF)] / 2 or

[RAF] = [0.5*(PR/PB) + 0.5*(NRAF)]

To simplify further, let's define PR/PB as the ratio of the change in population, or delta population:

PR/PB = Δ population = the ratio of the change in population. The RAF equation becomes:

[[RAF] = [0.5 * Δ population + 0.5 * NRAF]

If we just look at the factors, notice that each factor is multiplied by 0.5 in the RAF equation. This means that in the RAF portion of Adjustment Method formula, population is given 50 percent weighting and the NRAF portion is given 50 percent weighting. This is the default weighting.

Zero Percent or No Population Factor Weighting vs. default (50 percent) Population Factor Weighting Diversion Rate Impact for 1999

Our first comparison examines computing a diversion rate using zero, or no population factor in the RAF portion of the Adjustment Method formula versus the default 50 percent weighting in the RAF. The equation is:

[[RAF] = [**0** * Δ **population** + 1 * (NRAF)]

The resulting estimated maximum diversion rate calculations are displayed in the table below. This table displays the number of jurisdictions which occur at zero, plus or minus one, plus or minus two, and plus or minus greater than two percentage point difference in their estimated maximum diversion rate, as compared to the default calculation. Standard rounding is used in all tables found in this discussion paper. The jurisdictions are further separated into four population groups, including zero to 25,000, 25,000 to 50,000, 50,000 to 100,000, and greater than 100,000 population.

Table 1. Population Weighting of Zero Percent vs. Default Fifty Percent Weighting[19]

(Number of Jurisdictions)

		Population			
Difference	# Juris	0-25k	25-50k	50-100k	> 100k
<-2%	24	13	6	4	1
-2%	30	9	9	9	3
-1%	102	39	21	24	18
0%	154	54	34	28	38
1%	70	20	22	11	17
2%	28	13	5	6	4
>2%	37	23	7	6	1
	445	171	104	88	82

Displayed next is the same table as above, using the percentage of jurisdictions, instead of the number of jurisdictions, as the measured event.

[19] All tables in this discussion paper use standard rounding. All tables use jurisdiction's actual base-year and 1999 as the report-year. Please refer to the attachment titled, "Population Weight Comparison" for complete data used in these summaries.

Table 2. Population Weighting of Zero Percent vs. Default Fifty Percent Weighting[1]

(Percentage of Jurisdictions)

		Population			
Difference	% Juris	0-25k	25-50k	50-100k	> 100k
<-2%	5%	8%	6%	5%	1%
-2%	7%	5%	9%	10%	4%
-1%	23%	23%	20%	27%	22%
0%	35%	32%	33%	32%	46%
1%	16%	12%	21%	13%	21%
2%	6%	8%	5%	7%	5%
>2%	8%	13%	7%	7%	1%
	100%	100%	100%	100%	100%

From the tables, 35 percent, or 156 jurisdictions result in a lower estimated maximum diversion rate than using the default calculation. About 30 percent, or 135 jurisdictions calculate a higher estimated maximum diversion rate than the default. Nearly one third, 35 percent, or 154 jurisdictions have no change in their estimated maximum diversion rate. Seventy-four (74) percent, or 326 jurisdictions fall within plus or minus one percentage point of the default calculation. Looking at small cities, (those cities with population less than 25,000), 36 percent have lower diversion rates while 33 percent have higher diversion rates.

100 Percent Population Factor Weighting vs. default (50 percent) Population Factor Weighting Diversion Rate Impact for 1999

Our next comparison examines computing a diversion rate using 100 percent population factor in the RAF portion of the Adjustment Method formula versus the default 50 percent weighting in the RAF. In other words, the factors of employment and taxable sales are eliminated. The equation is:

[[RAF] = [**1** * Δ **population** + 0 * NRAF]

The resulting estimated maximum diversion rate calculations are displayed in the table below. This table displays the number of jurisdictions which occur at zero, plus or minus one, plus or minus two, and plus or minus greater than two percentage point difference in their estimated maximum diversion rate, as compared to the default calculation. The jurisdictions are further separated into four population groups, including zero to 25,000, 25,000 to 50,000, 50,000 to 100,000, and greater than 100,000 population.

Table 3. Population Weighting of One Hundred Percent vs. Default Fifty Percent Weighting[1]

(Number of Jurisdictions)

		Population			
Difference	# Juris	0-25k	25-50k	50-100k	> 100k
<-2%	26	19	3	4	0
-2%	26	12	7	5	2
-1%	70	22	18	12	18
0%	174	58	34	36	46
1%	89	34	26	17	12
2%	24	9	7	7	1
>2%	36	17	9	7	3
	445	171	104	88	82

Displayed next is the same table as above, using the percentage of jurisdictions, instead of the number of jurisdictions, as the measured event.

Table 4. Population Weighting of One Hundred Percent vs. Default Fifty Percent Weighting[1]

(Percentage of Jurisdictions)

		Population			
Difference	% Juris	0-25k	25-50k	50-100k	> 100k
<-2%	6%	11%	3%	5%	0%
-2%	6%	7%	7%	6%	2%
-1%	16%	13%	17%	14%	22%
0%	39%	34%	33%	41%	56%
1%	20%	20%	25%	19%	15%
2%	5%	5%	7%	8%	1%
>2%	8%	10%	9%	8%	4%
	100%	100%	100%	100%	100%

From the preceding tables, 28 percent, or 122 jurisdictions result in a lower estimated maximum diversion rate than using the default calculation. About 33 percent, or 149 jurisdictions calculate a higher estimated maximum diversion rate than the default. Thirty nine (39) percent, or 174 jurisdictions have no change in their estimated maximum diversion rate. Seventy-five (75) percent, or 333 jurisdictions fall within plus or minus one percentage point of the default calculation. Looking at small cities, (those cities with population less than 25,000), 31 percent have lower diversion rates while 35 percent have higher diversion rates.

Conclusions

- From these calculations, it appears that the weighting of the population factor in the RAF portion of the Adjustment method formula does impact the estimated maximum diversion rate calculated by more than plus or minus two (2) percent for about fourteen (14) percent of jurisdictions.
- It appears that this impact may be greater for smaller population jurisdictions, since there are a higher percentage of small jurisdictions that differ from the default calculation.
- Since changing the weighting of population factor results in different diversion rates for about fourteen (14) percent of jurisdictions, further examination to determine whether statistical analysis (regression analysis) of the population weighting is feasible with currently available data should be considered.

WHAT ECONOMIC ACTIVITY DOES TAXABLE SALES MISS?

A SB 2202 Adjustment Method Working Group Discussion Paper

May 3, 2001

What Are Taxable Sales?

Taxable Sales, also known as taxable transactions, are a tabulation by the State Board of Equalization (BOE) of the dollar amount of retail transactions (not the tax revenue amount) in California, except those specifically exempt from the California Sales and Use Tax. The use tax generally applies to the storage, use, or other consumption in this state of tangible personal property purchased from retailers in transactions not subject to the sales tax. Use tax may also apply to purchases shipped to a California consumer from another state. BOE publishes quarterly and annual taxable sales reports at http://www.boe.ca.gov that include taxable transactions data by city[20], unincorporated county area[21], countywide[22], and statewide.[23, 24] Hardcopy reports are available from BOE's Research and Statistics Division at (916) 445-0840.

Total taxable transactions do not necessarily indicate the gross sales of retailers dealing in taxable items. Only sales subject to sales or use tax are tabulated; excluded are sales for resale, sales of nontaxable items such as some food products and prescription medicines, and taxable transactions disclosed by BOE audits.

Some businesses dealing primarily **in nontaxable activities, such as services, manufacturing, contracting, or wholesaling**, either sell some merchandise that is subject to sales tax or use some items that were purchased ex-tax (without tax) and on which use tax must be paid. These transactions subject to sales or use tax are included in the tabulations.

Exemptions & Exclusions

Since 1933, many exemptions and exclusions have been granted that remove Sales & Use Tax liability for various types of property and certain individuals or organizations. BOE's 46-page July 1999 *Publication Number 61, Sales and Use Taxes: Exemptions and Exclusions*, includes two comprehensive listings that identify and describe these exemptions and exclusions by category and by alphabetical reference. The category listing (page 20-24) is

---

[20] *Taxable Sales In California (Sales & Use Tax):* Table 5 - Taxable Sales In The 272 Largest Cities (Taxable Transactions: Totals All Outlets); and Table 6 – Taxable Sales In All Cities Except The 272 Largest (Total Outlets: Taxable Transactions).

[21] *Taxable Sales In California (Sales & Use Tax):* Table 2 - Taxable Sales, By County (Taxable Transactions: Outside Incorporated Cities).

[22] *Taxable Sales In California (Sales & Use Tax):* Table 2 - Taxable Sales, By County (Taxable Transactions: Total).

[23] *Taxable Sales In California (Sales & Use Tax):* Table 2 – Taxable Sales, By County (Taxable Transactions: Total).

[24] Although a portion (10.8 % for 1999) of statewide taxable transactions reported by retailers to BOE have not been identified as belonging to a specific jurisdiction, all local and district sales tax revenue not directly allocated to specific jurisdictions by retailers is, in fact, distributed by BOE to individual counties, cities, and voter-approved special tax districts using a countywide or statewide pooling mechanism.

organized by major category, category, and sub-category within five tiers. For each sub-category there is an estimate of Sales & Use Tax revenue lost due to the exemption/exclusion. However, for many sub-categories the revenue lost is listed as "N/A" (not available) because the information is not known.

Major Categories, Categories (# of Sub-categories)		Sales & Use Tax Revenue Lost in Millions
I. NECESSITIES OF LIFE		
A. Food	(6)	$3,613.7+
B. Health Related	(10)	717.9+
C. Housing	(3)	3,264.0+
II. GENERAL PUBLIC BENEFIT		
A. Alternate Energy	(3)	N/A
B. Museums and Public Art Exhibits	(4)	N/A
C. Nonprofit, Religious, and Educational Organizations	(20)	13.3+
D. Other	(4)	N/A
III. INDUSTRY BENEFIT		
A. Transportation Related Industry	(16)	278.7+
B. Entertainment Industry	(4)	40.0+
C. Petroleum Industry	(1)	N/A
D. Manufactured Housing and Buildings	(6)	78.3+
E. Leasing Industry	(10)	44.0+
F. Other Industry or General Business Exemptions and Exclusions	(30)	508.6+
IV. EXCLUSIONS BY DEFINITION		
A. "Sales Price" and "Gross Receipts"	(10)	N/A
B. Transactions Not Considered Sales or Purchases of Tangible Personal Property	(7)	N/A
C. Exclusion From The Term "Person"	(2)	N/A
V. OTHER EXEMPTIONS, EXCLUSIONS, AND CREDITS	(10)	2.0+
	total:	8,560.5+

Annexations

Useful comprehensive annexation data is not readily available from BOE. It may be available, county-by-county, from Local Agency Formation Commissions (LAFCOs). BOE receives requests from county LAFCOs and other entities for estimates of local Sales & Use Tax revenues given specified proposed annexation boundary lines. When this occurs, a simple reply letter from BOE is prepared providing a rough estimate. However, the proposed annexation upon which this BOE estimate is based may never be implemented, and the final boundaries are likely to be different from the original proposal.

The impact of actual local government annexations on BOE data is complicated. Each month BOE receives 30 to 50 *Statement of Boundary Changes* from county LAFCOs. Included with the Statement of Boundary Changes are a map, a legal description of the new boundaries, and a statement regarding whether or not the annexed area is developed and/or inhabited. If the area is developed, the filing must also include an alphabetical listing of all streets and addresses within the annexed area.

The *Statement of Boundary Changes* statement regarding whether or not the annexed area has been developed is not always accurate and the filing does not include any information regarding land use, e.g., residential, commercial or industrial. BOE relies on the documentation supplied with the *Statement of Boundary Changes* to determine whether or not the area is developed and to identify those taxpayer's accounts with locations in the annexed area. This information is then used to initiate Seller's Permit registration changes to ensure proper coding of accounts and to compile data from previous allocations by these locations. These registration changes cause modified local Sales & Use Tax revenue advances to the local jurisdictions impacted by the annexation. For example, January estimated Sales & Use Tax payments by taxpayers are due February 4, and, using a combination of actual and historical data, about 90% of the local government portion is sent by BOE to local governments in March. This process is repeated each month.

BOE relies on taxpayers to provide complete and correct allocation information. However, the taxpayers have some latitude in the level of detail reported on their allocation schedules. For example, a national restaurant chain may submit a single tax return covering seven different restaurant locations, one in one jurisdiction and six in another. While the taxpayer must segregate the allocations for the two jurisdictions, they are not required to segregate the allocations for the six locations that are in the same jurisdiction. If only one of the six locations is included within the annexed area, it is impossible to determine the amount of local tax that will shift as a result of the annexation.

Because the taxpayer is not required to provide allocations broken down by specific locations, it is not possible to accurately determine the shift in revenues prior to the actual implementation of the annexation. After the annexation has been implemented and the allocation schedules have been modified to provide for the segregation of taxes based on the separate jurisdictions, it is possible to determine what funds should be provided to the city based on the annexation.

BOE's published values for taxable transactions (both *Taxable Sales in California*, and BOE's *Annual Report*) are based on taxpayer reported amounts including annexed areas since registration changes are made to coincide with the effective date for the annexed area. Accordingly, the published values should reflect annexation changes. Taxpayers are required to notify BOE if there is a change in business or mailing address. BOE's *Publication 73, Your California Seller's Permit*, explains what taxpayers are required to do.

The New Economy

Surveys by the Census Bureau now measure business to consumer e-commerce or "e-tailing" and have begun to measure business-to-business e-commerce. According to the U.S. Department of Commerce, "hard questions of definition and measurement will still have to be resolved before we can understand the full impact of these

changes on our economy."[6] Some jurisdictions have expressed concern about the impact of out-of-jurisdiction e-commerce on base-year to report-year taxable sales percentage change values, particularly if a jurisdiction has a base-year prior to 1996. Productivity growth, one of the most important indicators of economic growth, doubled its pace from a 1.4% average rate between 1973 and 1995, to a 2.8% rate from 1995 to 1999. To date, jurisdiction concern over the loss of Sales & Use Tax revenue due to e-commerce has been outweighed by national political forces that do not want to burden the "new economy" with a national sales tax, or require e-tailers to collect a myriad of local government sales taxes for every sales tax district in the nation. This may reflect the fact that the evolution of digital business is still in an early stage. A recent survey by the National Association of Manufacturers, for example, found that more than two-thirds of American manufacturers still do not conduct business electronically. In March 2000, the Census Bureau released the first official measure of an important subset of business-to-consumer e-commerce, "e-retail." In the fourth quarter of 1999, online sales by retail establishments totaled $5.3 billion, or 0.64% of all retail sales. Clearly, the impact of e-commerce on taxable sales, and potential deterioration of the correlation between taxable sales and waste generation, should be carefully monitored.

Taxable Transactions Margin of Error

Technically, there is no such value because the reported taxable transaction amounts are not estimates. The amounts reported are complete counts of reported taxable transactions. There are no sampling errors since there are no samples. There are other types of error such as taxpayers reporting an incorrect amount.

BOE audits approximately three percent of active accounts each year, concentrating on those considered most likely to be inaccurate in their tax reporting. In fiscal year 1998-99, the sales and use tax audit program disclosed net deficiencies of more than $357.0 million, or 1.19% of a total $30.0 billion in California sales and use tax revenue. The most common taxpayer noncompliance categories were:

- Sales for resale without supporting documentation
- Purchases made from out-of-state vendors without payment of use tax
- Withdrawal from resale inventory for own use

The top four types of businesses making errors were:

- Publishers
- Distributors of Light Industrial Equipment
- Manufacturers and Wholesalers of Electronics Equipment
- Construction Contractors and Sellers of Building Materials

The number of sales and use taxpayers registered to do business in California was 976,502 as of June 30, 1999.[26]

Are There Alternatives?

The fact that there are many economic transactions not subject to the California Sales and Use Tax does not invalidate it as an indicator or correlate of waste generation. The challenge is to find a better indicator, i.e., one that by itself, or when combined with employment change or some other economic measure, is more strongly correlated with waste generation. According to BOE's David Hayes, Statistics Section, "there is no other source for Taxable Transactions amounts because BOE is the only entity that collects the transaction data and the tax revenue. Caution should be used if a City proposes the use of 'City' Taxable Sales data. This amount is highly likely to be taxable sales **revenue** received from BOE during a specific year[27]. This (revenue) amount may be

[6] *Digital Economy 2000,* U.S Department of Commerce, p.4, Letter from Secretary William M. Daley.

[26] State Board of Equalization, *1998-99 Annual Report*, p. 27-31.

[27] The Sales & Use Tax Rate beginning January 1, 2001 is comprised of: 5.75% State Tax, 0.25% County Tax, 1.00% Local Tax, and where applicable, a voter-approved special District Tax ranging from 0.125% in Nevada, Solano, and Stanislaus Counties to 1.25% in San Francisco County.

affected by several factors, including audit revenue for taxable transactions that may have occurred years prior to the year in which the revenue is received by the jurisdiction. Another factor affecting jurisdiction taxable sales revenue is jurisdiction–to-jurisdiction fund transfers."[28] As data is received via taxpayer payments, desk audits, and field audits, BOE makes about 2,000 jurisdiction-to-jurisdiction fund transfers/month.

Some measures of economic activity not subject to the California Sales and Use Tax were considered, but rejected, by the original AB 2494 Adjustment Method Working Group. They included:

- Number of Business Permits
- Size of Business
- Type of Business
- Wages/Salaries
- Real Property Tax Base
- Construction (Housing Starts, Permits)
- Built Space (Gross Square Footage)
- Built Space Capacity Utilization
- Gross National Product
- Climate and Weather History
- Land Use/Land Type

These measures were not pursued due to problems with quantification, direct link to waste generation, lack of standardized statewide data, ease-of-use, accuracy, and other practical criteria.

If a jurisdiction finds neither the countywide nor the jurisdiction level base-year to report-year taxable transactions percentage change values reasonably represent economic change for their jurisdiction, then it should be discussed in their Annual Report to the Board. Alternatives to relying on these taxable transactions values include:

- Establish a regional solid waste management agency
- Establish a new base-year waste generation amount
- Conduct a generation-based analysis (estimate diversion tons + disposal tons from Disposal Reporting System for a particular year)
- Use an alternative measure of economic change
- Use taxable transactions values for diversion rate estimate in Annual Report, but rely on diversion program implementation data to show "good faith effort" to reach diversion goal.
-

[28] California State Board of Equalization, David Hayes, Statistics Section, March 23, 2001 telephone conversation.

SB 2202 ADJUSTMENT METHOD FACTOR RATING (PRELIMINARY EVALUATION)

This is a summary of the responses to the preliminary evaluation of alternative factors. Working group members were asked to complete this evaluation during the second Adjustment Method working group meeting. Eight (8) responses were received, although eleven (11) group members were in attendance at least part of the day. If any group member did not get a chance to submit their evalution, but would like to do so now, please feel free to e-mail, fax, or mail it to any of the Adjustment Method staff.

Working group members are represented by the letters A B C …, individual scoring is shown below the letters, an average for the criteria is displayed on the far right of the table. (Blank spaces indicate no response given)

The Alternative Factor rating sheet asked members to:

Please rate the following default and proposed alternative factors or methods using the evaluation criteria. Please rate as the default factor, an alternative factor, or both. Use the following scale for your evaluation:

0 = Does not meet the Criteria
1 = Does not strongly meet the Criteria
2 = Somewhat meets the Criteria
3 = Strongly meets the Criteria
4 = Meets the Criteria Completely
Colored cell means no score was given to this criteria

Population: Default factor (DOF Population Data)	**Member Responses**								
Criteria	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Average score**
When conbined, factors correlate best to tons of waste generated	3	3	3	4	3	4	3	3	**3.25**
Flexible, simple and easy to use providing at least a minimum level of accuracy and uniformity for all jurisdictions	3	3	4	4	4	4	3	4	**3.63**
Cost effectiveness in data acquisition and processing (Acquisition costs and staff costs)	4	4	4	4	4	4	3	4	**3.88**
Available at county-level for all jurisdictions	4	3	4	4	4	4	3	4	**3.75**
							Average Total		**3.63**

Employment: Default factor (EDD: Labor Force)	**Member Responses**								
Criteria	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Average score**
When conbined, factors correlate best to tons of waste generated	1	3	2		3		3	1	**2.17**
Flexible, simple and easy to use providing at least a minimum level of accuracy and uniformity for all jurisdictions	2	3	1	4	3	1	3	1	**2.25**
Cost effectiveness in data acquisition and processing (Acquisition costs and staff costs)	2	3	4	4	3	4	3	4	**3.38**
Available at county-level for all jurisdictions	4	3	4	4	4	4	3	4	**3.75**
							Average Total		**2.89**

Employment: EDD Industry	**Member Responses**								
Criteria	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Average score**
When conbined, factors correlate best to tons of waste generated	1	3	3		2	4	2	3	**2.57**
Flexible, simple and easy to use providing at least a minimum level of accuracy and uniformity for all jurisdictions	2	3	1	4	1	4	2	3	**2.50**
Cost effectiveness in data acquisition and processing (Acquisition costs and staff costs)	2	3	4	4	1	2	2	4	**2.75**
Available at county-level for all jurisdictions	2	3	4	4	4	4	2	4	**3.38**
							Average Total		**2.80**

Employment: BEA Industry	**Member Responses**								
Criteria	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Average score**
When conbined, factors correlate best to tons of waste generated	1	1	3		0	1	2	0	**1.14**
Flexible, simple and easy to use providing at least a minimum level of accuracy and uniformity for all jurisdictions	2	1	3	4	0	1	2	0	**1.86**
Cost effectiveness in data acquisition and processing (Acquisition costs and staff costs)	2	1	4	4	0	3	2	4	**2.86**
Available at county-level for all jurisdictions	4	1	4	4	4	4	2	4	**3.86**
							Average Total		**2.43**

Employment: EDD Labor Force (RAF)/EFF Labor Force (NRAF)	**Member Responses**								
Criteria	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Average score**
When conbined, factors correlate best to tons of waste generated	1	2	2			1	2	0	**1.33**
Flexible, simple and easy to use providing at least a minimum level of accuracy and uniformity for all jurisdictions	2	2	2	3		1	2	0	**1.71**
Cost effectiveness in data acquisition and processing (Acquisition costs and staff costs)	2	2	4	4		4	2	0	**2.57**
Available at county-level for all jurisdictions	4	2	4	4		4	2	0	**2.86**
							Average Total		**2.12**

Employment: Labor Force (RAF)/BEA Industry (NRAF)	**Member Responses**								
Criteria	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Average score**
When conbined, factors correlate best to tons of waste generated	3	1	2			3	2	0	**1.83**
Flexible, simple and easy to use providing at least a minimum level of accuracy and uniformity for all jurisdictions	2	1	2	3		3	2	0	**1.86**
Cost effectiveness in data acquisition and processing (Acquisition costs and staff costs)	2	1	4	4		4	2	0	**2.43**
Available at county-level for all jurisdictions	4	1	4	4		2	2	0	**2.43**
							Average Total		**2.14**

Inflation Adjustment: Default CPI	**Member Responses**								
Criteria	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Average score**
When combined, factors correlate best to tons of waste generated	1	4	2	2	3	4	3	0	**2.38**
Flexible, simple and easy to use providing at least a minimum level of accuracy and uniformity for all jurisdictions	3	4	2	4	4	4	3	0	**3.00**
Cost effectiveness in data acquisition and processing (Acquisition costs and staff costs)	3	4	4	4	4	4	3	4	**3.75**
Available at county-level for all jurisdictions	4	4	1	1	4	4	3	4	**3.13**
							Average Total		**3.06**

Inflation Adjustment: BOE deflator	**Member Responses**								
Criteria	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Average score**
When conbined, factors correlate best to tons of waste generated	3	1		4	1	4	3	4	**2.86**
Flexible, simple and easy to use providing at least a minimum level of accuracy and uniformity for all jurisdictions	1	1		3	1	3	3	4	**2.29**
Cost effectiveness in data acquisition and processing (Acquisition costs and staff costs)	2	1		4	1	3	3	4	**2.57**
Available at county-level for all jurisdictions	3	1		1	4	2	3	4	**2.57**
							Average Total		**2.57**

Taxable Sales: Default BOE Taxable Sales	**Member Responses**								
Criteria	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Average score**
When conbined, factors correlate best to tons of waste generated	3	3		3	3	3	3	4	**3.14**
Flexible, simple and easy to use providing at least a minimum level of accuracy and uniformity for all jurisdictions	3	3		4	3	4	3	4	**3.43**
Cost effectiveness in data acquisition and processing (Acquisition costs and staff costs)	3	3		4	3	4	3	4	**3.43**
Available at county-level for all jurisdictions	4	3		4	3	4	3	4	**3.57**
							Average Total		**3.39**

Taxable Sales: Alternative Proposal (Use a portion of taxable sales)	**Member Responses**								
Criteria	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Average score**
When conbined, factors correlate best to tons of waste generated		3					3	4	**3.33**
Flexible, simple and easy to use providing at least a minimum level of accuracy and uniformity for all jurisdictions		3					3	4	**3.33**
Cost effectiveness in data acquisition and processing (Acquisition costs and staff costs)		3					3	4	**3.33**
Available at county-level for all jurisdictions		3					3	4	**3.33**
							Average Total		**3.33**

Recommendations Forwarded to Synthesis Group from Adjustment Method Working Group

Adjustment Method Formula Accuracy

Ref #	Solution Considered	Working Group Recommendation	Issue Addressed	Criteria Met/Considerations	Forward to Synthesis Group? Yes/No	Additional Staff Comments
AM 1.0	1A. Allow continuing use of the existing Adjustment Method (AM) because it estimates waste generation for majority of jurisdictions. There are various sources/types of errors which make the diversion rate estimate (which uses the AM) an indicator, not an absolute measured diversion rate value.	Short term High priority	1. Do combined default population and economic change factors, and formula weights, accurately estimate waste generation?	Cost effective Adequate for most jurisdictions Consistent year to year methodology Data is accessible Does not correct for other types of errors in the goal measurement system Easy to use	YES	No additional cost anticipated. No change in AM accuracy. Re-affirming that AM produces an estimate, not an absolute measurement, may prompt added emphasis on diversion program implementation information.

	1B. Continue further statistical analysis of the accuracy of AM formula, including factor weighting, long term accuracy, and inter-relationships between independent variables.	Ongoing		Improve accuracy over time Reasonable cost May require additional statistical assistance Benefits a large number of jurisdictions	YES	May require additional staff and/or contract funding by the Board. Greater AM accuracy may require more complex AM formula. May or may not benefit many jurisdictions.
	1C. Require new base-year if balanced growth rate for population, employment, and CPI-adjusted taxable sales exceeds 14%.	Medium to long term High priority		May require regulatory or statutory change Reduces compliance order frequency	YES	May require regulatory or statutory change. Substantial Board resources needed to process, evaluate and present new base-year requests to Board. Significant jurisdiction cost. Many jurisdictions could be required to do new base-years.
	2. Board staff disseminates information on alternative adjustment factors that have been accepted or denied previously, by publishing this information on Board web site. Provided that data source meets regulatory requirements, allow flexibility in considering an allowable alternative to a default factor.	Short term High priority	2. Excessive or time consuming scrutiny of alternative adjustment factors or data sources.	Beneficial to jurisdictions Relatively easy to implement	YES	Minimal Board cost. May require policy or guidelines to address how acceptable vs. non-acceptable alternative adjustment factor data is presented. May increase success rate of new alternative adjustment factor proposals. Unknown impact on number of new alternative adjustment factor proposals.

Population

Ref #	Solution Considered	Working Group Recommendation	Issue Addressed	Criteria Met/Considerations	Forward to Synthesis Group? Yes/No	Additional Staff Comments
AM 1.1	1. Continue using DOF population in the Adjustment Method formula.	Ongoing	1. How accurate is DOF population estimate?	Flexible and easy to use Cost effective Currently, only source available for all jurisdictions and county level	YES	No additional cost. No change in AM accuracy.

AM 1.2	2. Monitor 2000 Census data publication & investigate potential issues.	Short term Medium to low priority	2. Will 2000 Census data change DOF population estimates and impact diversion rate estimates?	1/1/2000 DOF population estimates (Board default 2000 population) did not rely on 2000 Census data, so not an issue for 2000 diversion rates May impact accuracy of future diversion rates	YES	No additional cost anticipated. Future impact on diversion rates unknown.

Employment

Ref #	Solution Considered	Working Group Recommendation	Issue Addressed	Criteria Met/Considerations	Forward to Synthesis Group? Yes/No	Additional Staff Comments
AM 1.3	1. Allow continuing use of county level EDD Labor Force Employment as default AM factor.	Ongoing	1. Is EDD Labor Force Employment the most accurate measure available?	Flexible and easy to use Cost effective Available at county level	YES	No additional cost anticipated. No change in AM accuracy.
	2. Use county level EDD Labor Force Employment or county level EDD Industry Employment as default AM factor.	Short term High priority	2. How does county level EDD Industry Employment compare to EDD Labor Force Employment?	No difference for most jurisdictions Available at no charge EDD Industry Employment available for most jurisdictions No change in regulation or statute required	YES	Minimal additional staff resources may be required for Board staff & jurisdiction training. Increases jurisdiction flexibility, does not necessarily improve AM accuracy. Jurisdictions with low population and large industrial base likely to benefit.
	3. Accept county level BEA Industry Employment as alternative adjustment factor.	Short term High priority	3. How does U.S. Dept. of Commerce, Bureau of Economic Analysis (BEA) Industry Employment compare to EDD Industry Employment?	Existing regulations do not specify BEA Employment Available at no charge Minimal diversion rate impact	YES	Minimal additional staff resources may be required to train Board staff. Increases jurisdiction flexibility, does not necessarily improve AM accuracy.
	4. Use third party private sector information as alternative measure of employment.	Short term High priority	4. Are there other sources for measures of employment?	Existing regulations do not specify a specific private sector source for Employment data Available at some cost Diversion rate impact unknown	YES	Minimal to moderate additional Board staff resources needed to review alternative factor proposals. Moderate jurisdiction cost vs. unknown benefit of obtaining and utilizing this data. Increases jurisdiction flexibility, unknown impact

Employment (continued)

Ref #	Solution Considered	Working Group Recommendation	Issue Addressed	Criteria Met/Considerations	Forward to Synthesis Group? Yes/No	Additional Staff Comments
	5. Accept city level EDD Industry Employment as alternative adjustment factor.	Short term High priority	5. Is it feasible to use city level EDD Industry Employment as a default?	Not available for 1990 base-year; Allow 1991data substitution for 1990 base-year if city demonstrates 1990-1991 employment trend was increasing Substantial EDD charge for data Data is by zip code, and zip codes change over time Zip code may not coincide with jurisdiction boundaries	YES	Minimal to moderate additional Board staff resources needed to review alternative factor proposals. Moderate jurisdiction cost vs. unknown benefit of obtaining and utilizing this data. Data acquisition cost for jurisdictions proportional to jurisdiction size. Increases jurisdiction flexibility, does not necessarily improve AM accuracy. Jurisdictions with low population and large industrial base likely to benefit. Report-year data not available until December following report-year.
	6. Accept use of EDD Labor Force Employment for Residential Adjustment Factor (RAF) calculation, and EDD Industry Employment for Non-Residential Adjustment Factor (NRAF) calculation, as alternative AM formula.	Long term High priority	6. Is it acceptable to allow use of EDD Labor Force Employment to estimate residential waste generation and to use EDD Industry Employment to estimate non-residential waste generation?	Available at low cost Requires manual diversion rate calculation Minimal diversion rate impact Industry Employment available for most jurisdictions Requires regulatory change	YES	Moderate Board cost to change regulations and modify Web site. Minimal to moderate jurisdiction cost. Adds complexity to AM formula.
	7. Accept jurisdiction employment data from business licenses as alternative AM factor.	Short term High priority	7. Is it feasible to use jurisdiction business license employment data as an alternative AM factor?	Requires use of same data collection methodology for base-year and report-year Available at low cost	YES	Minimal to moderate additional Board cost. Minimal cost for jurisdictions. Increases jurisdiction flexibility, unknown impact on AM accuracy.

						on AM accuracy.

Taxable Sales

Ref #	Solution Considered	Working Group Recommendation	Issue Addressed	Criteria Met/Considerations	Forward to Synthesis Group? Yes/No	Additional Staff Comments
AM 1.4	1. Allow continuing use of Board Of Equalization (BOE) Taxable Sales.	Ongoing	1. How accurate is BOE Taxable Sales?	No cost	YES	No additional cost anticipated. No change in AM accuracy.
	2. Publish information on what economic activities are included/missed in Taxable Sales.	Short term High priority	2. What economic activity does Taxable Sales miss?	No cost Supported by existing BOE publication	YES	Minimal Board cost. Should increase jurisdiction understanding of "taxable sales".
	3. Publish information on the extent and scope of errors in CIWMB estimates of fourth quarter Taxable Sales.	Short term High priority	3. Do CIWMB estimates of fourth quarter Taxable Sales add error?	No cost	YES	Minimal Board cost. May increase number of jurisdictions that amend ARs with BOE final data.

CPI

Ref #	Solution Considered	Working Group Recommendation	Issue Addressed	Criteria Met/Considerations	Forward to Synthesis Group? Yes/No	Additional Staff Comments
AM 1.5	1. Continue use of CPI as default inflation adjustment for report-year BOE Taxable Sales.	Ongoing	1. How accurate is CPI and does it overestimate true inflation and reduce impact of BOE Taxable Sales adjustment factor?	Low cost Easy to use Comparative accuracy unknown	YES	No additional cost anticipated. No change in AM accuracy. CPI widely understood by jurisdictions.
	2. Do further research on merits of using BOE's Taxable Sales Deflator, rather than CPI, in AM formula.	Medium term Medium priority	2. How does BOE's Taxable Sales Deflator differ from CPI?	Not widely used and requires special calculations Available at no charge Comparative accuracy unknown	YES	Moderate Board cost to research further, uncertain cost/benefit. Use of BOE Taxable Sales Deflator in default AM formula would require regulatory change.

Diversion Rate Measurement Accuracy Factors

Ref #	Solution Considered	Working Group Recommendation	Issue Addressed	Criteria Met/Considerations	Forward to Synthesis Group? Yes/No	Additional Staff Comments
AM 2.0	1A. Develop tiered approach to evaluating diversion rate accuracy in Biennial Review: <u>Level 1</u> Diversion rate estimate is acceptable due to lack of special circumstances. <u>Level 2</u> Diversion rate estimate accuracy is somewhat less due to special circumstances. <u>Level 3</u> Diversion rate estimate accuracy is questionable due to special circumstances. Add standard "red flag" table of circumstances (that may decrease accuracy of diversion rate estimate) to jurisdiction AR & Biennial Review Agenda Item. <u>Red Flag conditions include:</u> Base-year age Jurisdiction size Jurisdiction growth rate Unbalanced jurisdiction growth Extreme high/low base-year residential generation % Jobs to population ratio Significant change in nature of solid waste production Diversion rate decline despite same or greater diversion program implementation Annexations?? Rainfall?? Large visitor influx Large construction projects Drastic change in AM factor	Short term High priority	1. What jurisdiction characteristics affect diversion rate accuracy?	Low cost Addresses limits of data in AM Not a quantitative measure of error Provides Board similar information for each jurisdiction Identifies jurisdictions which might have special circumstances that decrease accuracy of AM formula Diversion rate is rough indicator	YES	Minimal to moderate Board cost to implement. Moderate jurisdiction cost. Provides jurisdictions and Board more comprehensive data for informed judgments. May prompt more jurisdictions to initiate new base-year studies. May prompt added emphasis on diversion program implementation information. May need Board discussion on implementing tiered approach and "red flag" table of circumstances.

Diversion Rate Measurement Accuracy Factors (continued)

Ref #	Solution Considered	Working Group Recommendation	Issue Addressed	Criteria Met/Considerations	Forward to Synthesis Group? Yes/No	Additional Staff Comments
	2. Have the State fund cooperative solid waste generation studies to establish new jurisdiction base-years.	Long term High priority	2. How can base-year accuracy be improved at reduced cost?	Low cost for jurisdictions, high cost for State Will improve accuracy	YES	May require statutory change. Substantial Board cost. If properly conducted, will improve AM accuracy.

Awareness

Ref #	Solution Considered	Working Group Recommendation	Issue Addressed	Criteria Met/Considerations	Forward to Synthesis Group? Yes/No	Additional Staff Comments
AM 3.0	1. Publish information on inherent limits of base-year generation amounts, AM formula, & report-year disposal. Publish list of things jurisdictions can do to understand AM, and conduct public workshops on an ongoing basis.	Short Term High priority	1. Is Adjustment Method misunderstood?	Low cost Likely to improve accuracy Increase Adjustment Method understanding	YES	Minimal Board cost. May improve quality of ARs and jurisdiction understanding of goal measurement system.

Recommendations Not Forwarded to the Synthesis Group From Adjustment method working Group

Taxable Sales

Ref #	Solution Considered	Working Group Recommendation	Issue Addressed	Criteria Met/Considerations	Forward to Synthesis Group? Yes/No	Additional Staff Comments
AM 1.4	**4.** Extend August Annual Report (AR) due date to fall months to avoid need for CIWMB Taxable Sales estimates. Use Final BOE	Not Recommended	**4.** Should August AR due date be extended to use actual BOE	Requires statutory & regulatory change Increases "lag-time" between report-year and	NO	Requires statutory & regulatory change. Unknown jurisdiction benefit. Knowledge of jurisdiction progress delayed further.

	Taxable Sales data.		Taxable Sales instead of CIWMB estimates?	base-year Improved diversion rate accuracy for some jurisdictions May reduce costs if jurisdictions do not amend ARs Currently, jurisdiction may amend AR to provide updated data		May improve AM accuracy for a few jurisdictions.
	5A. Use Taxable Sales <u>revenue</u> as alternative for taxable transactions.	Not Recommended	**5.** Are there alternatives to BOE Taxable Sales?	Currently a source of diversion rate inaccuracy due to audit revenue lag time and jurisdiction-to-jurisdiction fund transfers Requires regulatory change	NO	Requires regulatory change. BOE does not support statistical validity of this change.
	5B. Use economic change measures rejected by AB 2494 Working Group.	Not Recommended		Difficult to use Doubtful accuracy Not quantifiable Not directly linked to waste generation No standardized statewide data	NO	Should decrease AM accuracy.