



These materials were developed by CalRecycle staff for specific workshops and are posted as reference documents for the local government, interest groups and industry staff who attended this workshop.

*If you require assistance in obtaining access to this presentation, call the Office or Public Affairs at (916) 341-6300.*



# State of Recycling and Disposal in California - 2013

Presented by:

- Mark Umfress
- Karen Morrison, Ph.D.
- Peter Staklis

March 24, 2015

# State of Recycling and Disposal in California

## Presentation Overview:

- History and Statutes
- Infrastructure
- Questions/Policy Issues

# History

AB 2020 (1986) – Beverage Container Recycling and Litter Reduction Act

- Created the CRV program for beverage containers
- Administered by the Division of Recycling (DOR)

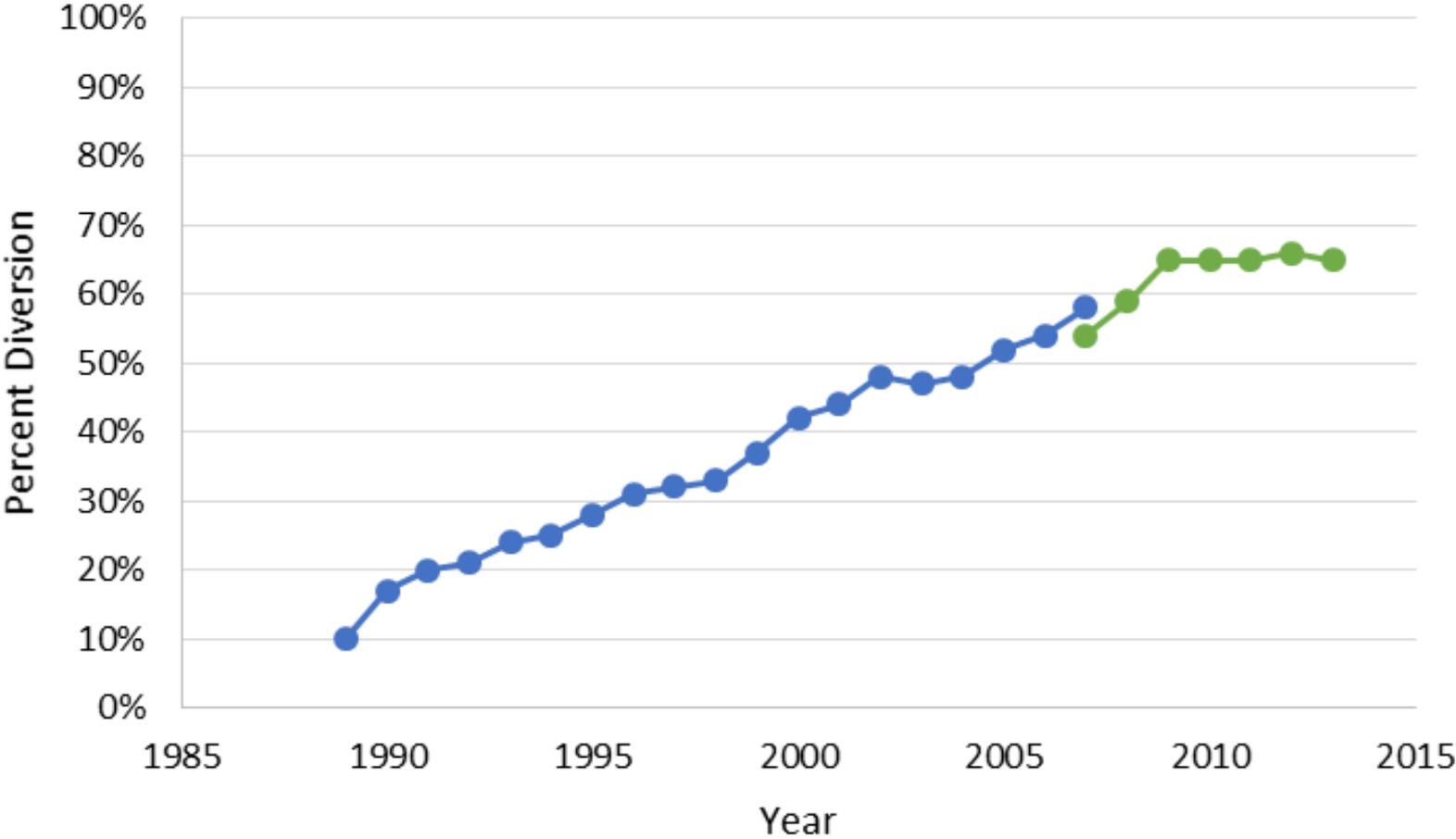
AB 939 (1989) – Integrated Waste Management Act

- Created the Integrated Waste Management Board
- Mandated diversion by local jurisdictions

SB 63 (2010)

- Created the Department of Resources Recycling and Recovery (CalRecycle)

# History – AB 939/SB 1016 Statewide Diversion Rate



# History – AB 341

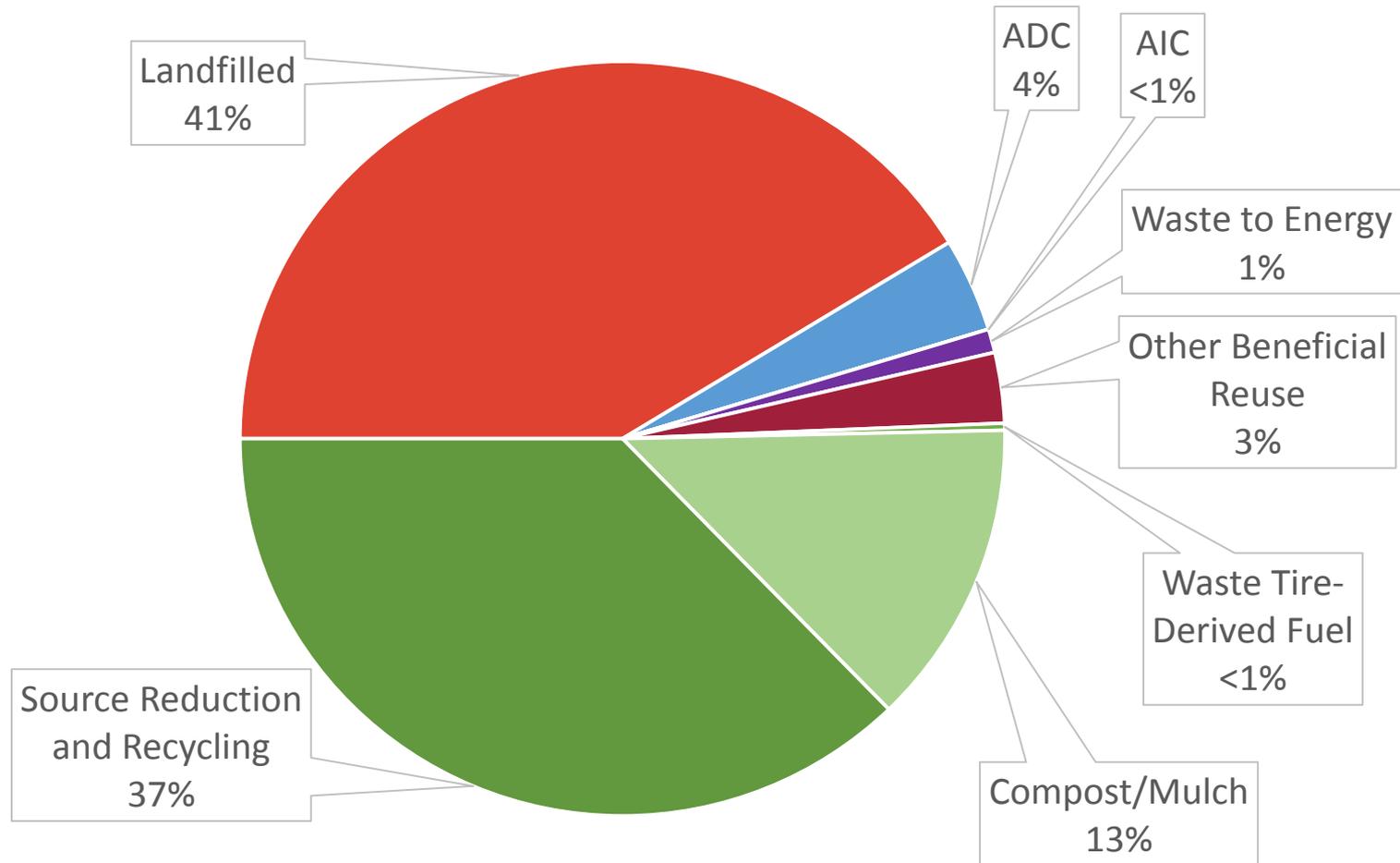
## AB 341 (2011) – 75% Recycling

- Mandatory commercial recycling
- Statewide goal to achieve 75% recycling by 2020
- Did not change diversion mandates for local jurisdictions
- Several differences between 75% recycling goal and 50% diversion mandate

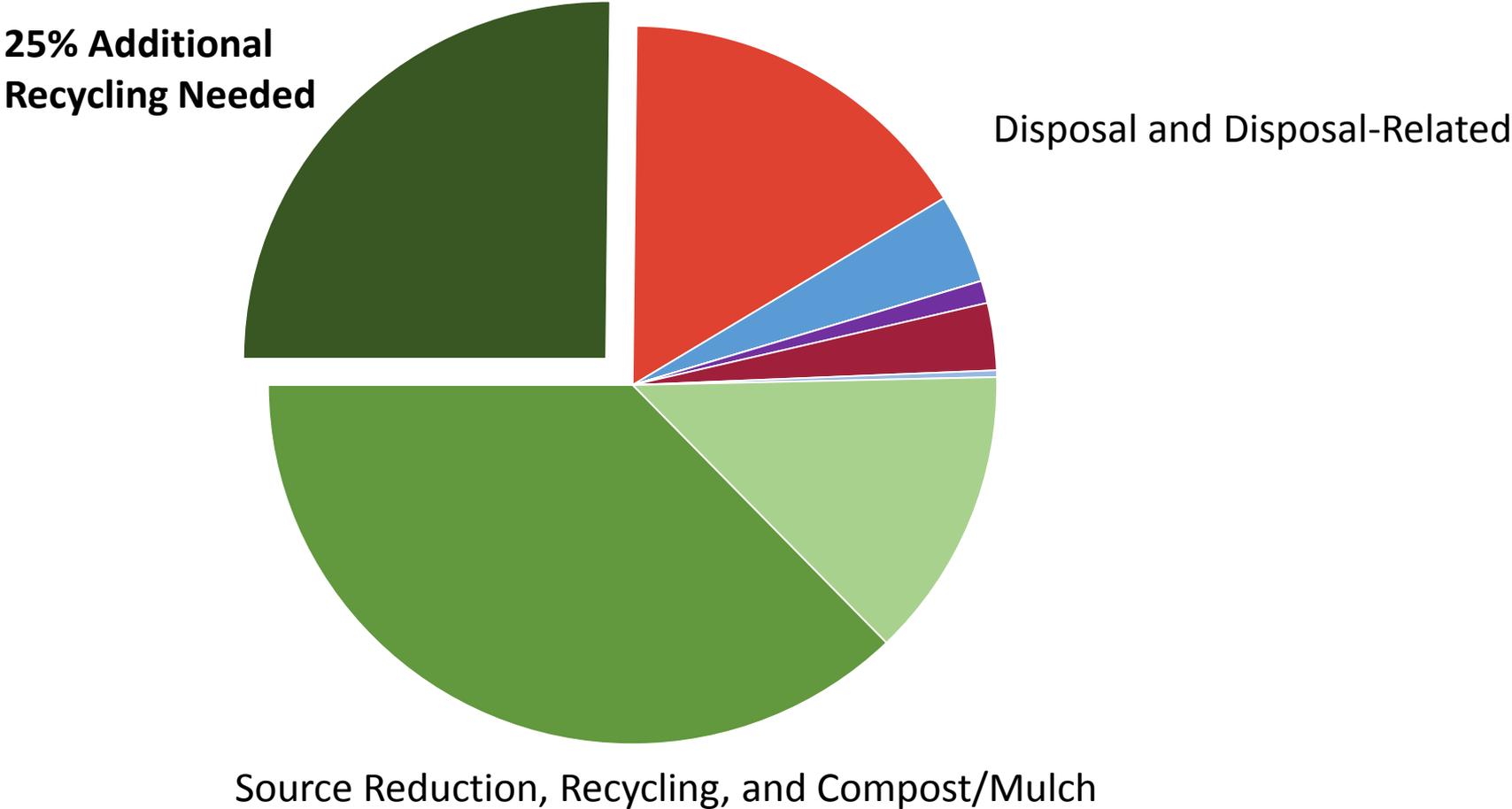
	<b>AB 939</b>	<b>AB 341</b>
Goal	50 Percent Diversion (Jurisdictional Mandate)	75 Percent Recycling (Statewide Goal)
Baseline Generation (Statewide)	12.6 ppd (2003-2006)	10.7 ppd (1990-2010)
Disposal Target (Statewide)	6.3 ppd	2.7 ppd

	AB 939	AB 341
Activities that Do Not Count Toward Goal	<u>Disposal:</u> Landfilling Exported Disposal Some Transformation Engineered MSW Post-2020 Green Waste ADC	<u>Disposal:</u> Landfilling Exported Disposal All Transformation Engineered MSW <u>Disposal-Related:</u> ADC AIC Other Beneficial Reuse Waste Derived Fuel
Activities that Count Toward Goal	<u>Diversion:</u> Source Reduction Composting Recycling ADC (Alternative Daily Cover) AIC (Alternative Intermediate Cover) Other Beneficial Reuse Transformation Credit	<u>Recycling:</u> Source Reduction Composting Recycling

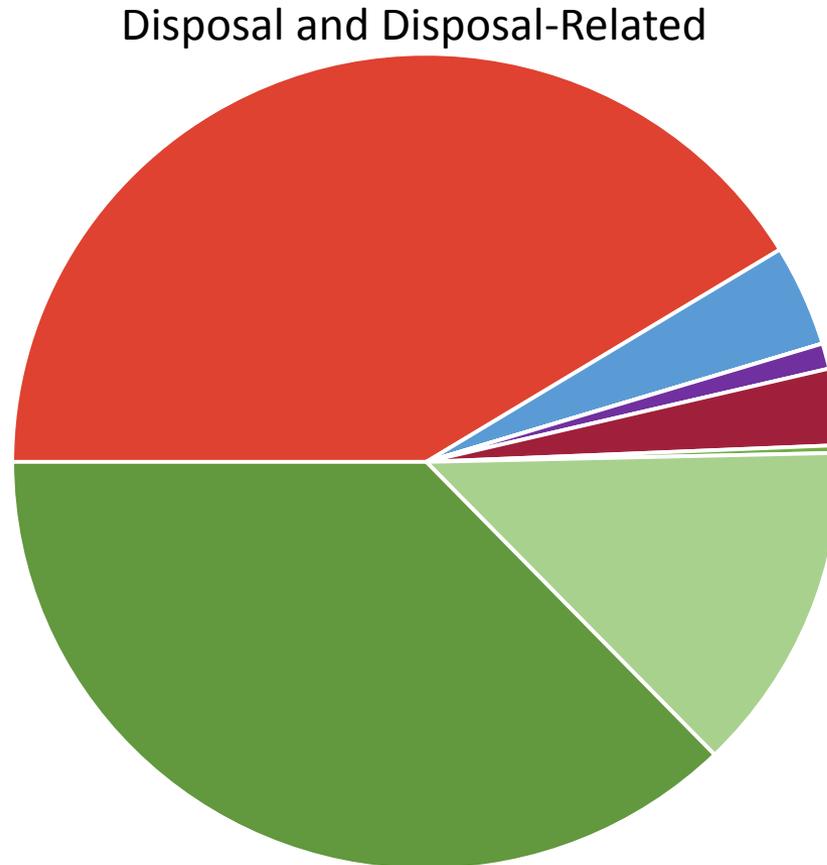
# 2013 Statewide Generation Estimate



# Statewide Generation to Meet 75% Recycling Goal

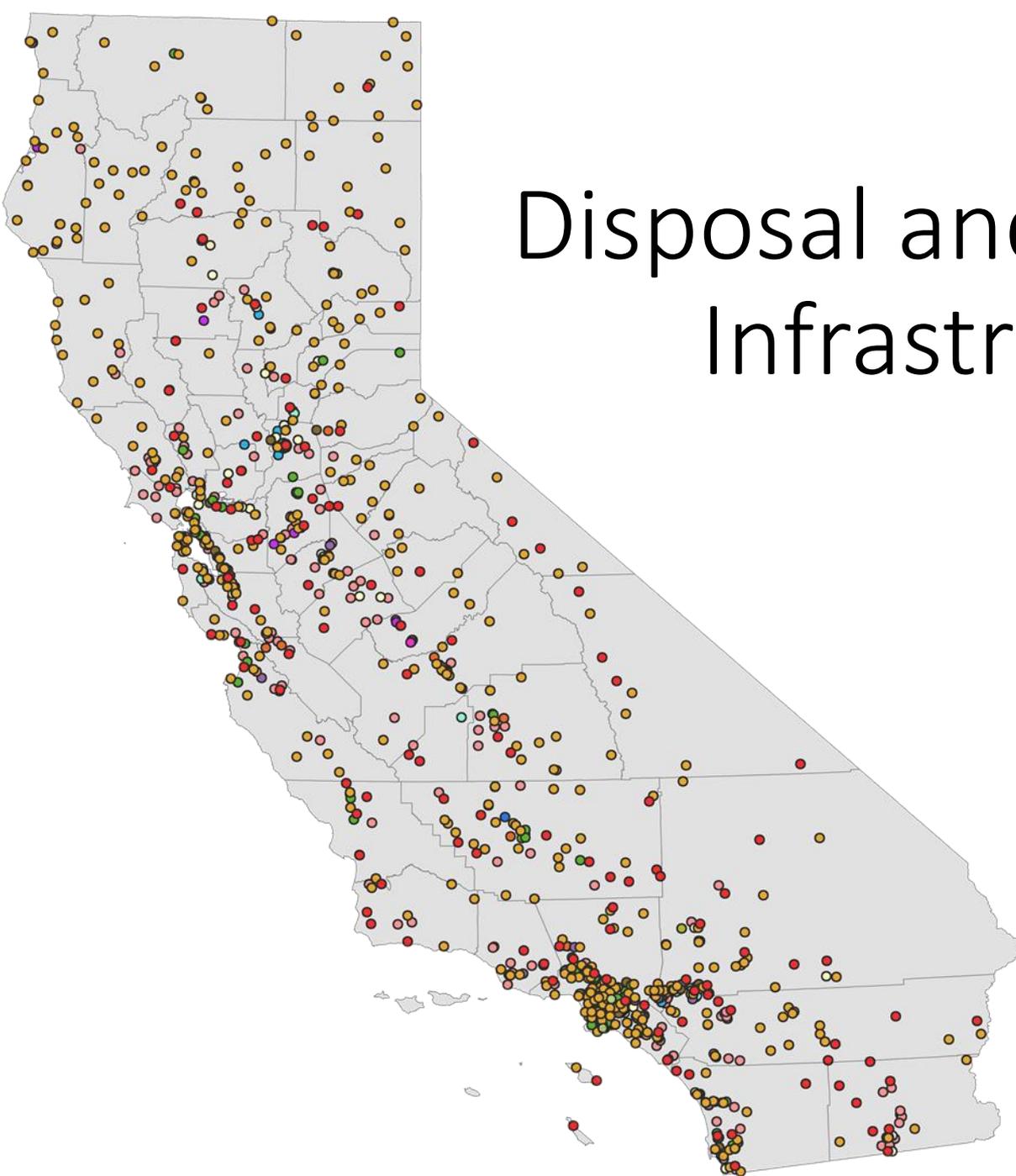


# 2013 Statewide Generation

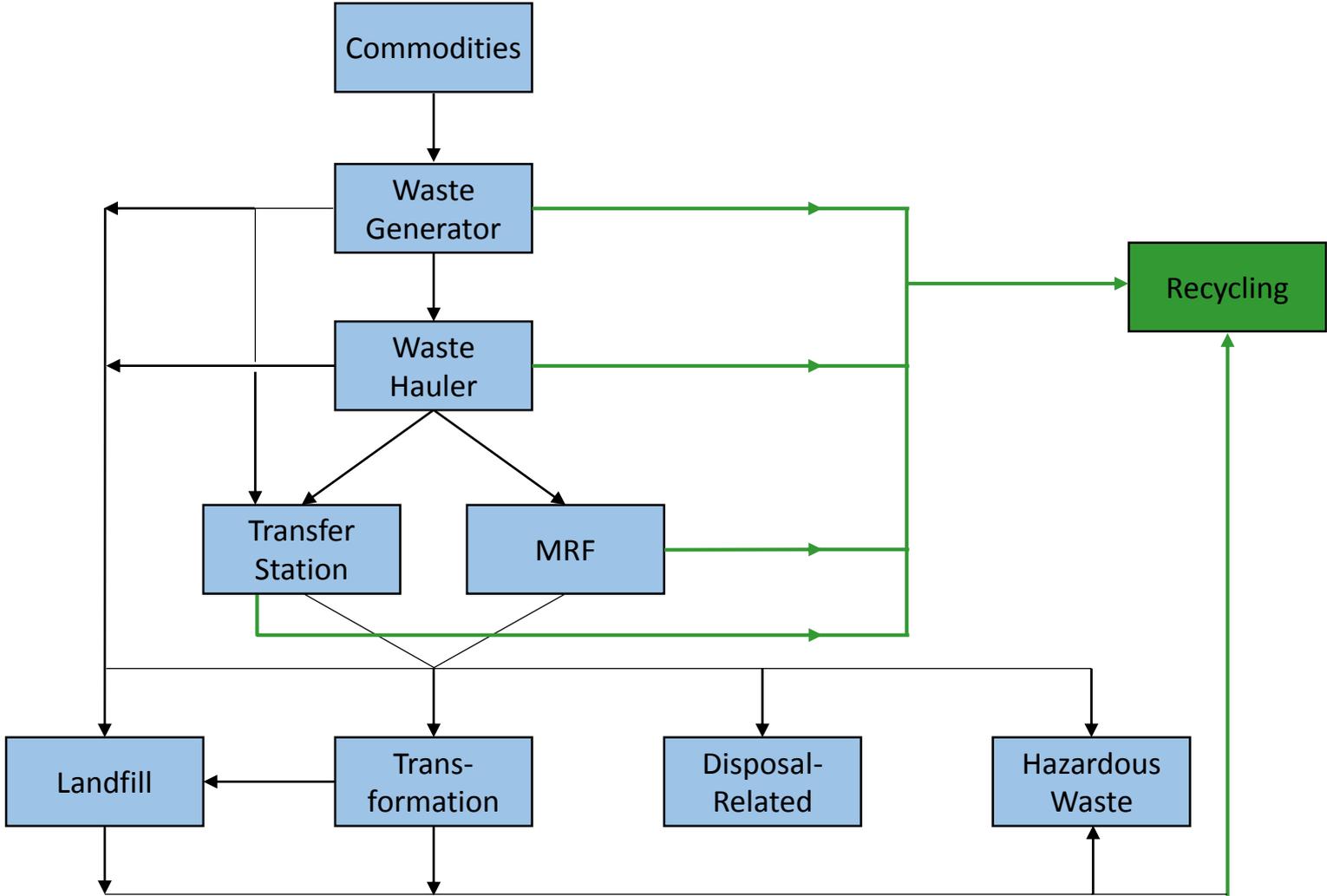


Source Reduction, Recycling, and Compost/Mulch

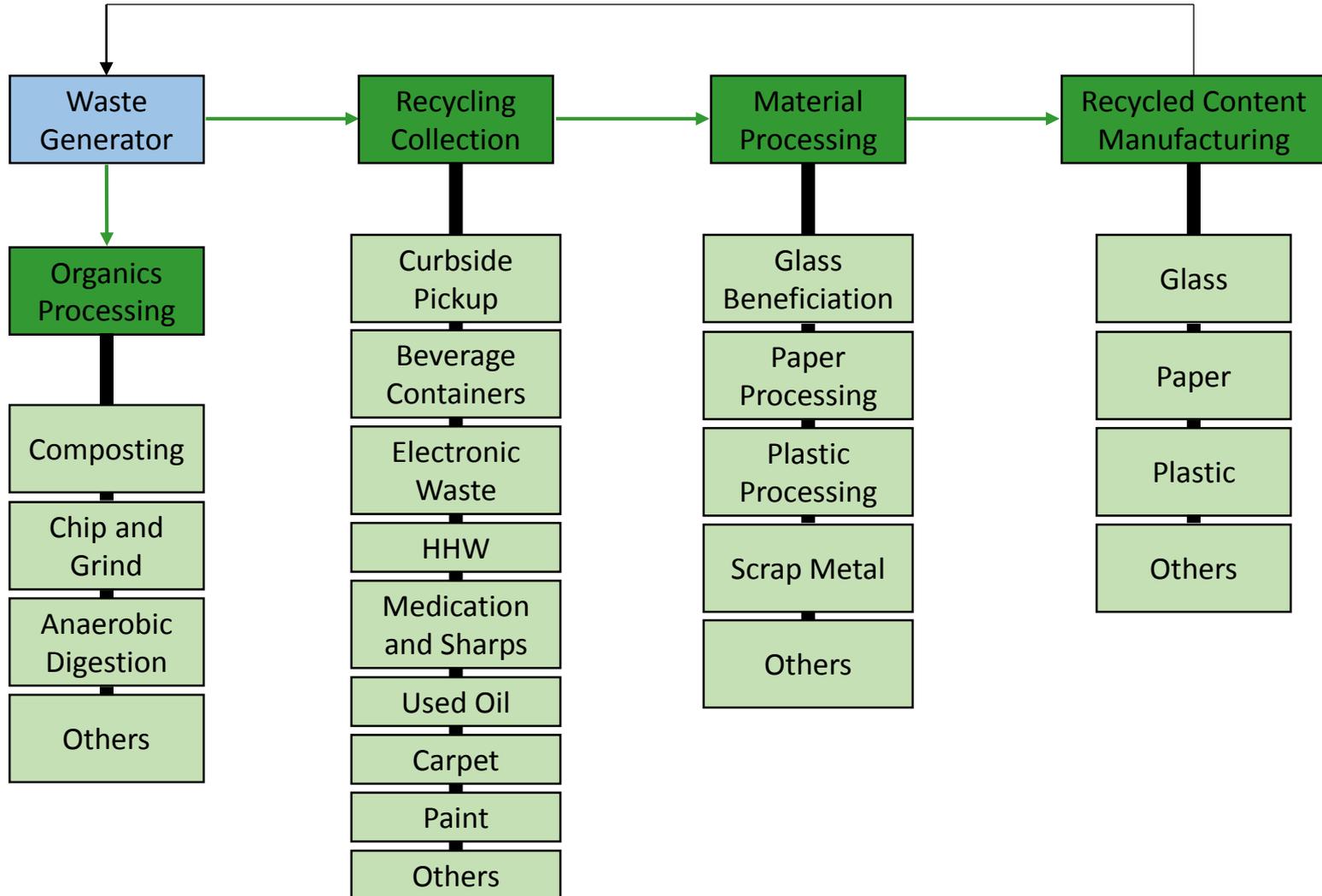
# Disposal and Recycling Infrastructure



# Solid Waste Infrastructure in California

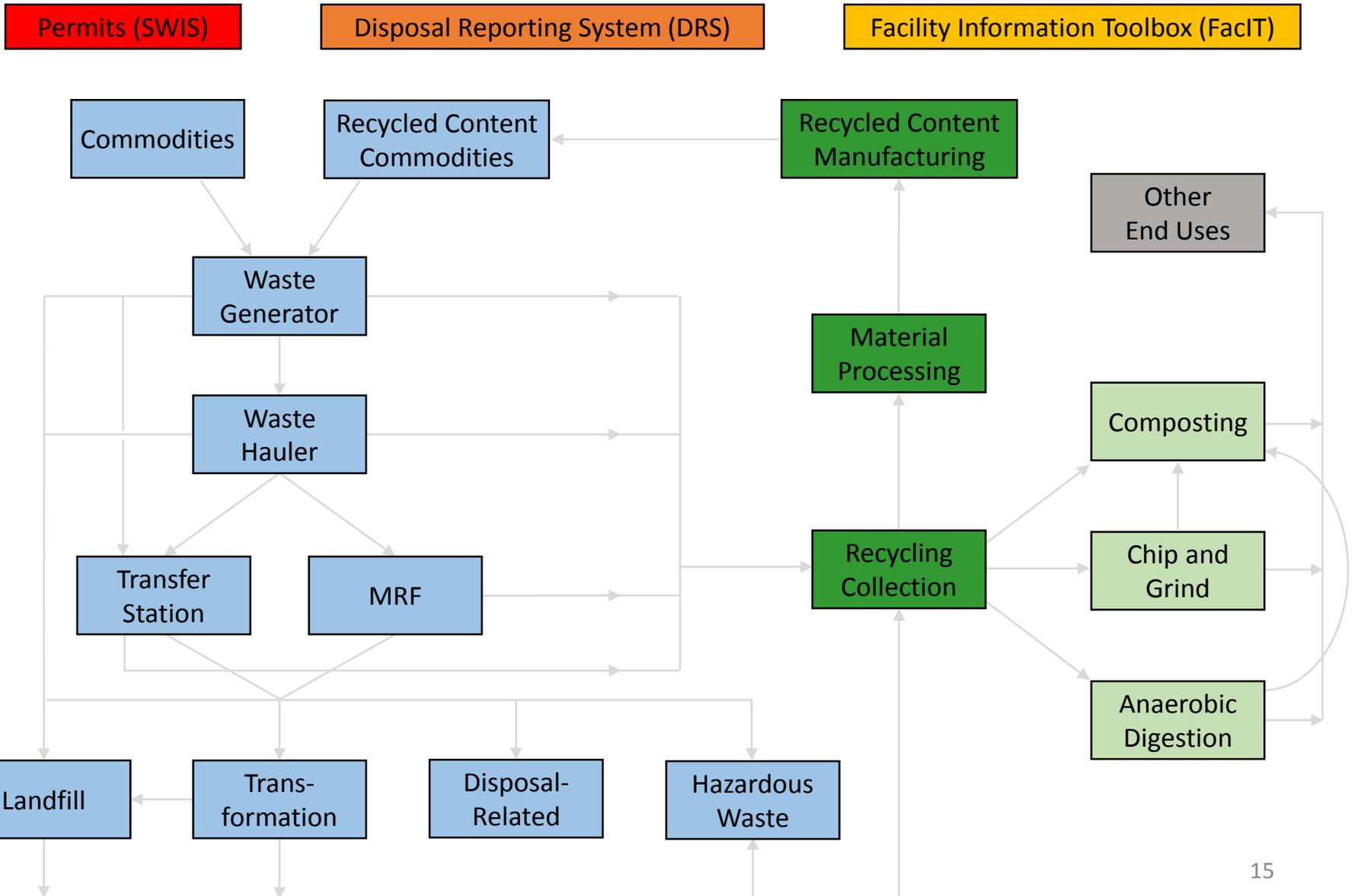


# Recycling Infrastructure in California

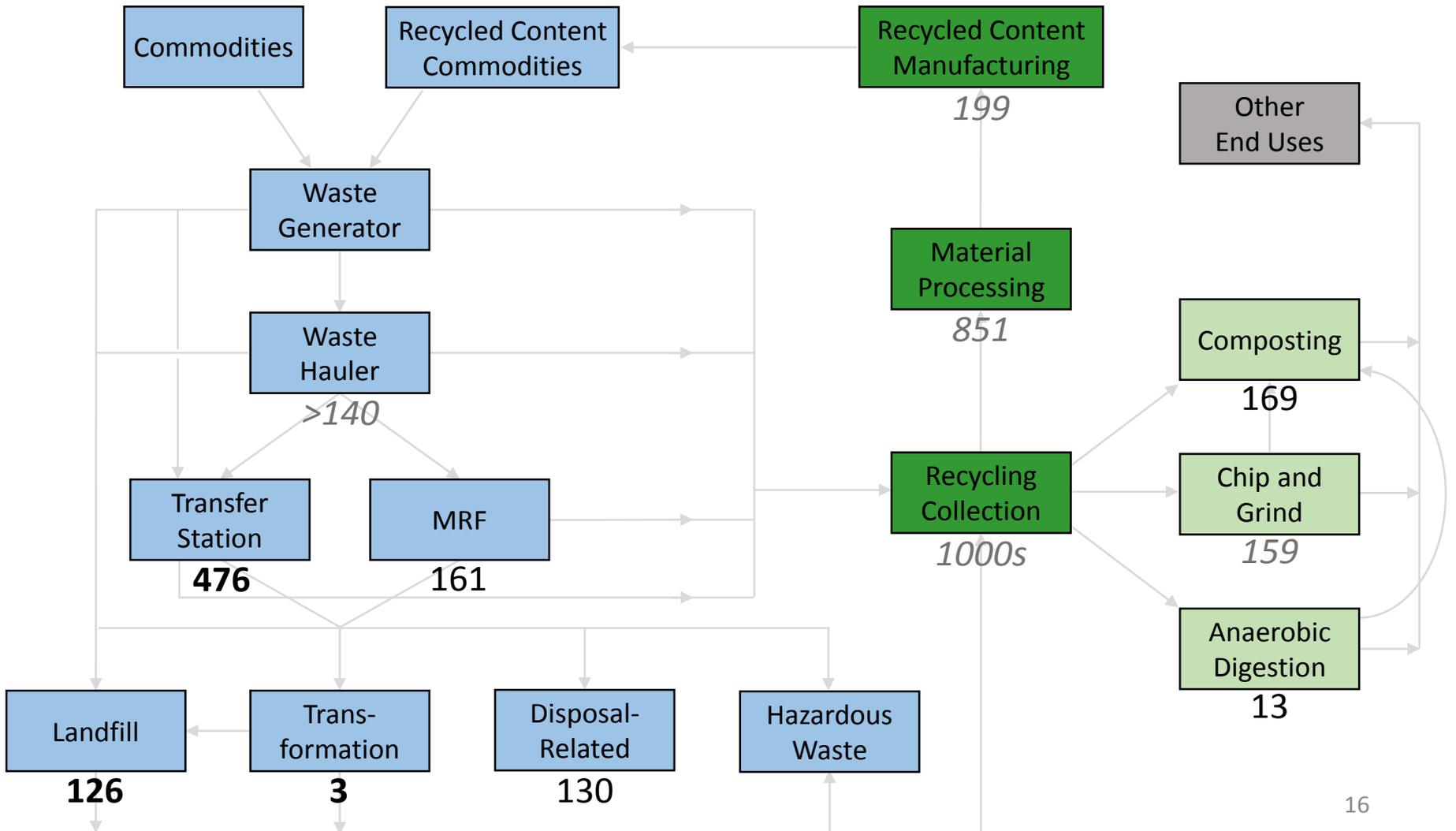




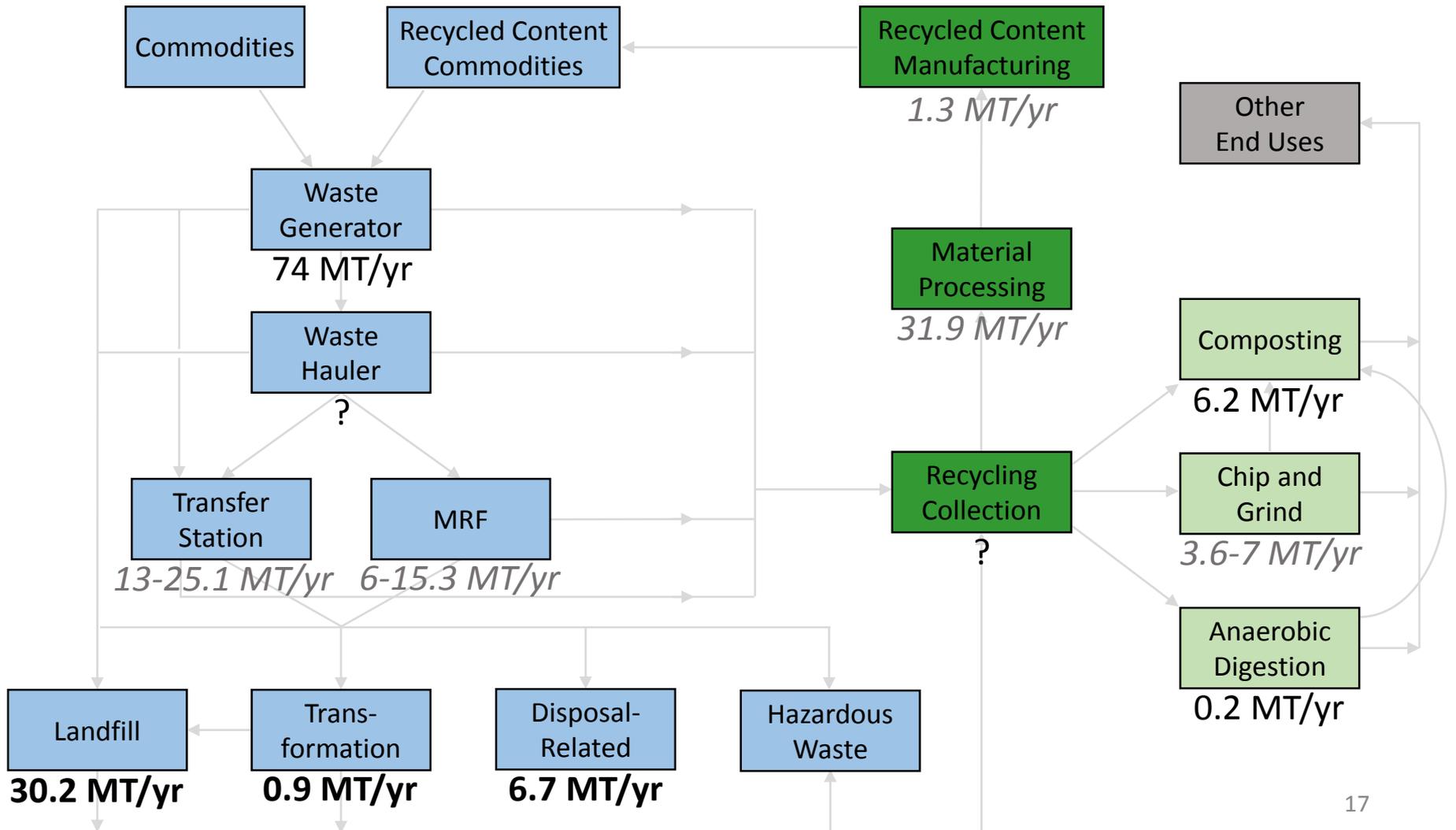
# Tracking Facilities and Activities



# Facility Count



# Facility Throughput

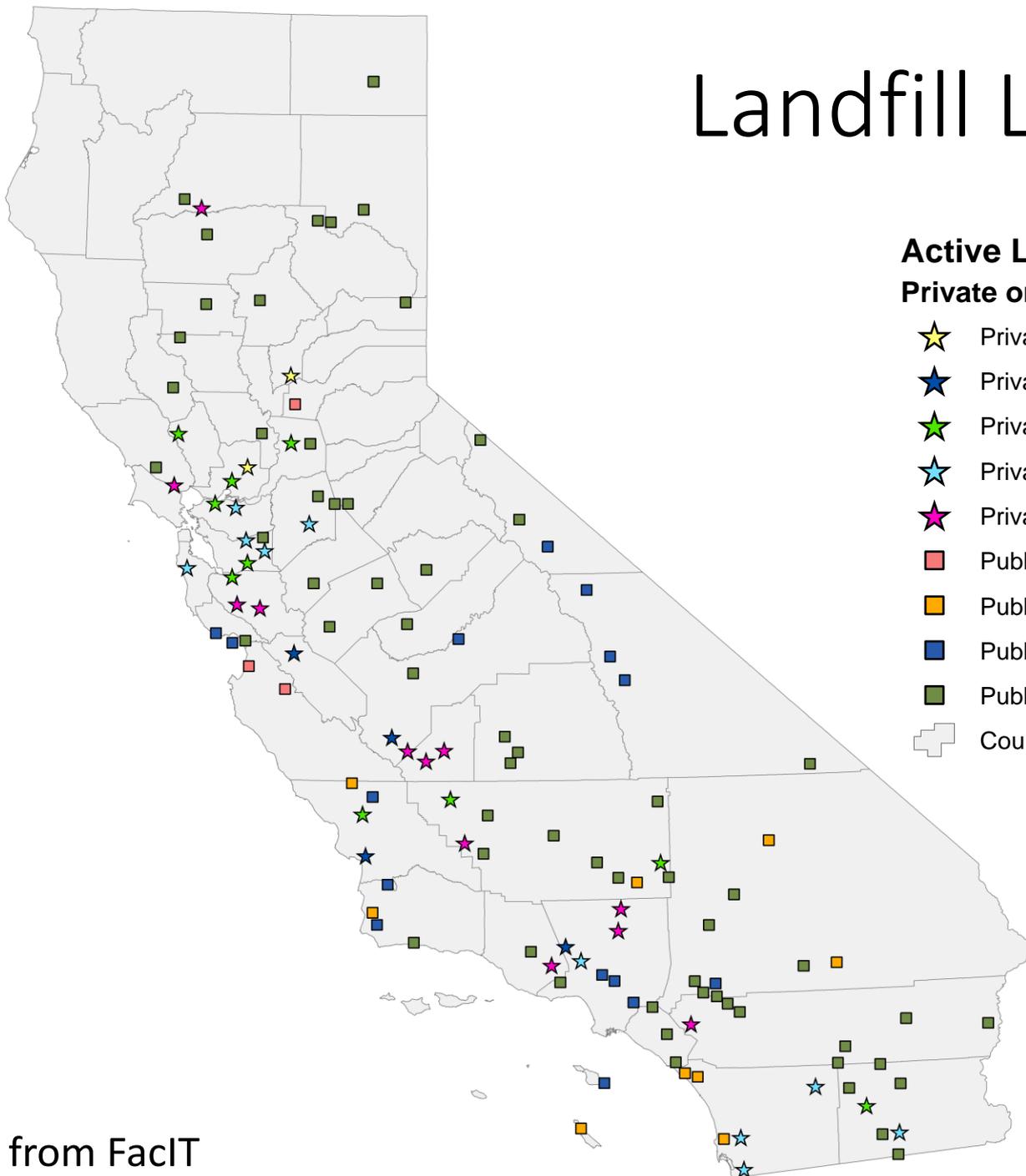


# Landfill Locations

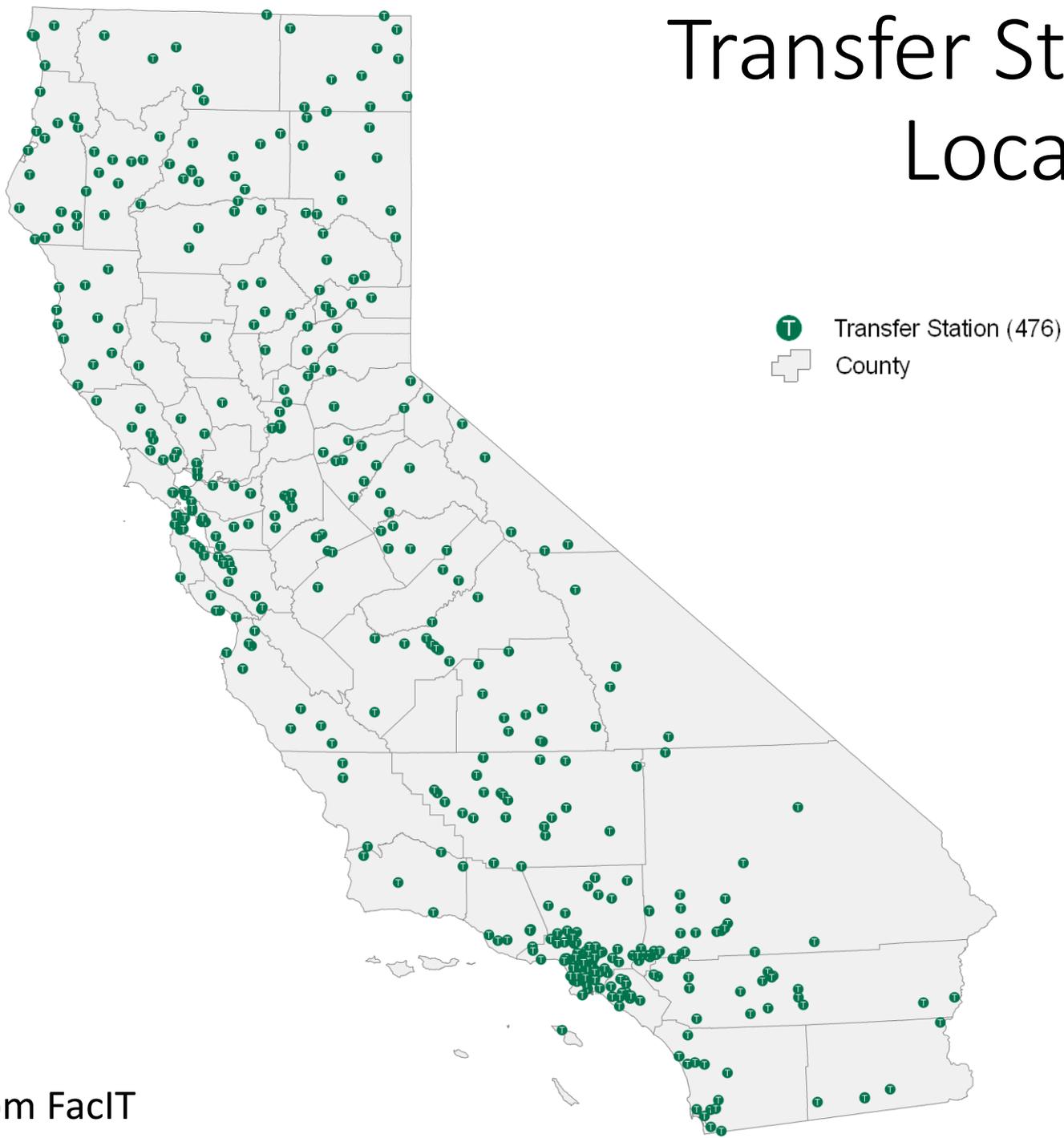
## Active Landfills

### Private or Public, Ownership

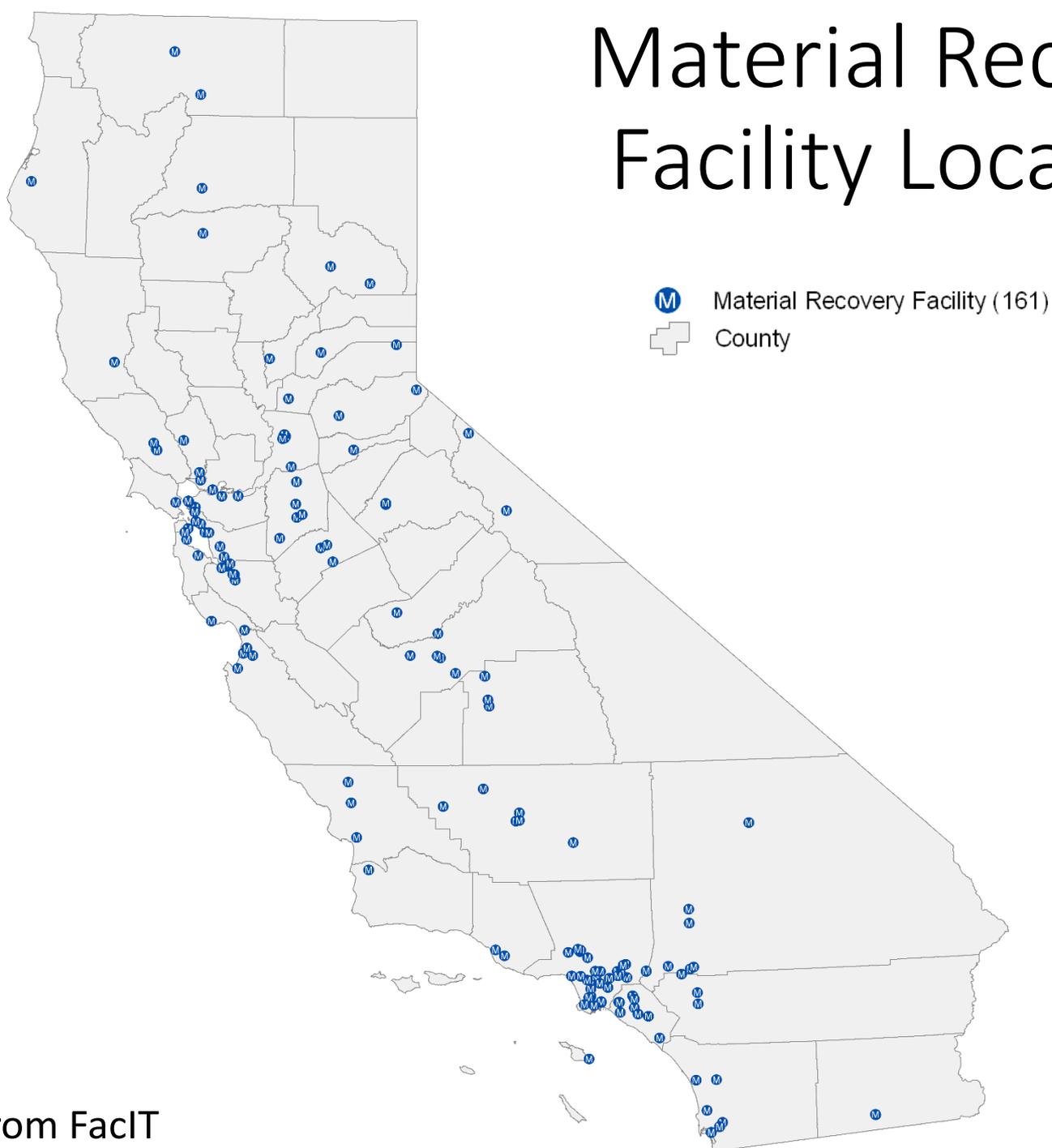
- ★ Private, Recology (2)
- ★ Private, Waste Connection (4)
- ★ Private, Independent (10)
- ★ Private, Republic (10)
- ★ Private, Waste Management (12)
- Public, Regional Agency (3)
- Public, Federal (9)
- Public, City (15)
- Public, County (61)
- ⊕ County



# Transfer Station Locations

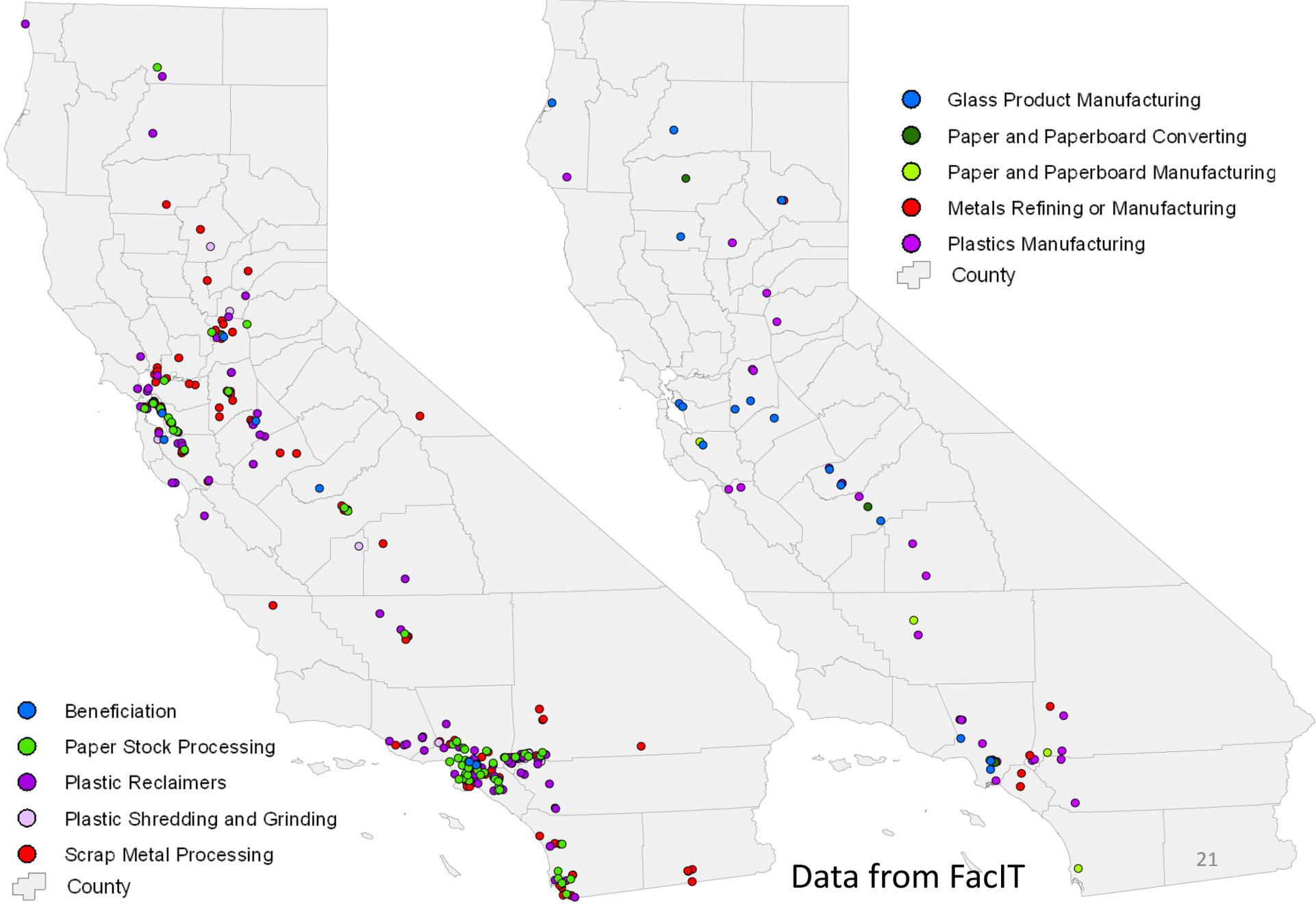


# Material Recovery Facility Locations

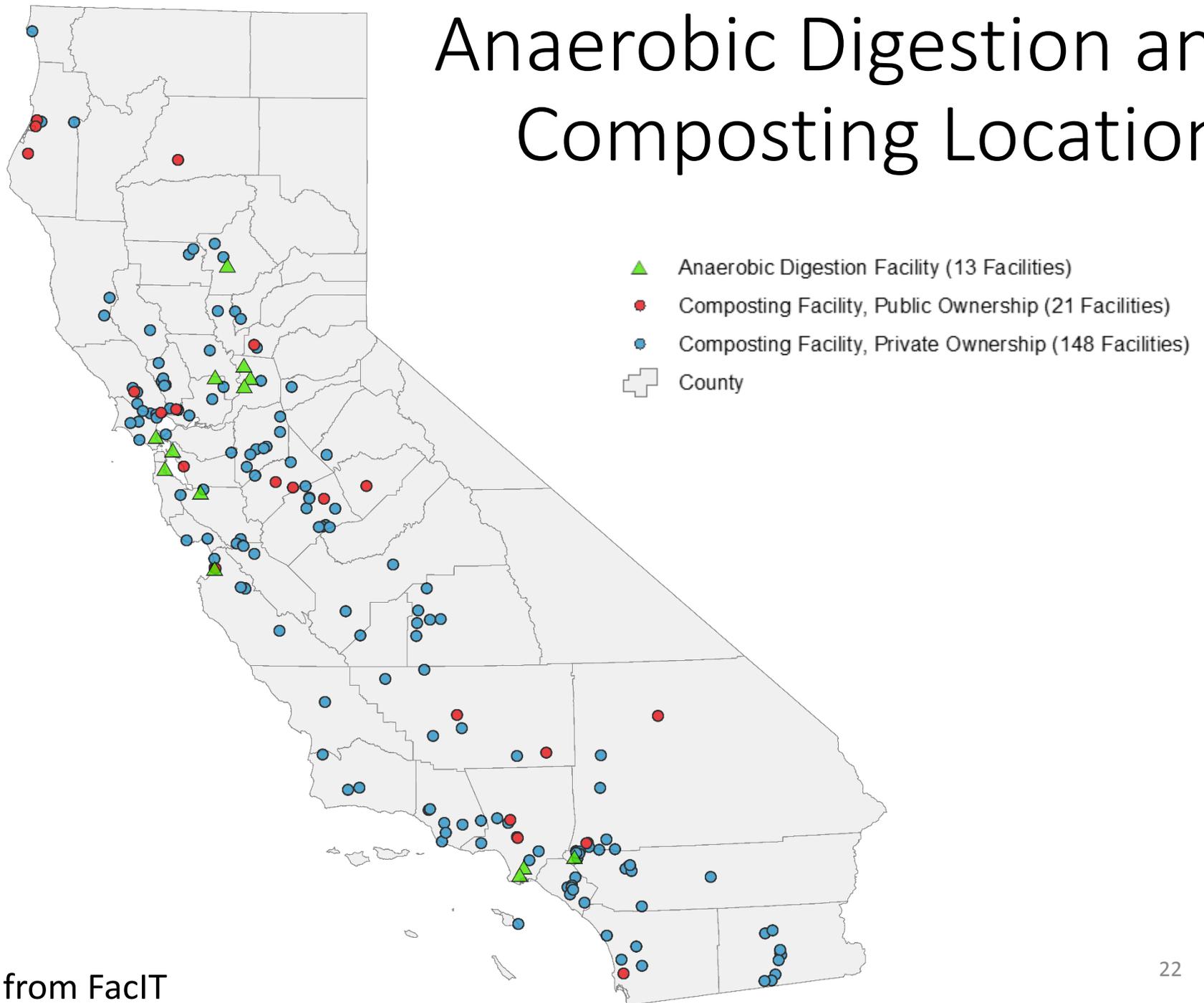


# Processing

# Manufacturing

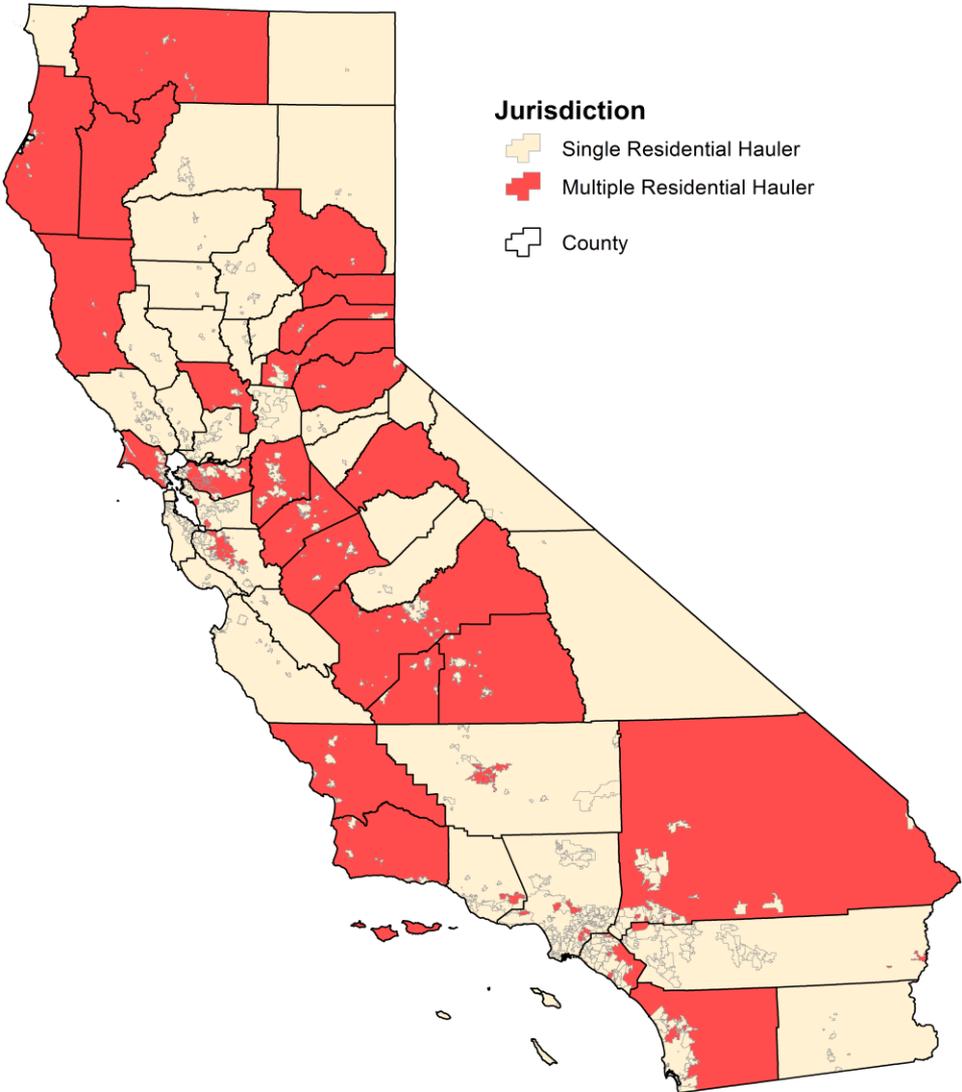


# Anaerobic Digestion and Composting Locations

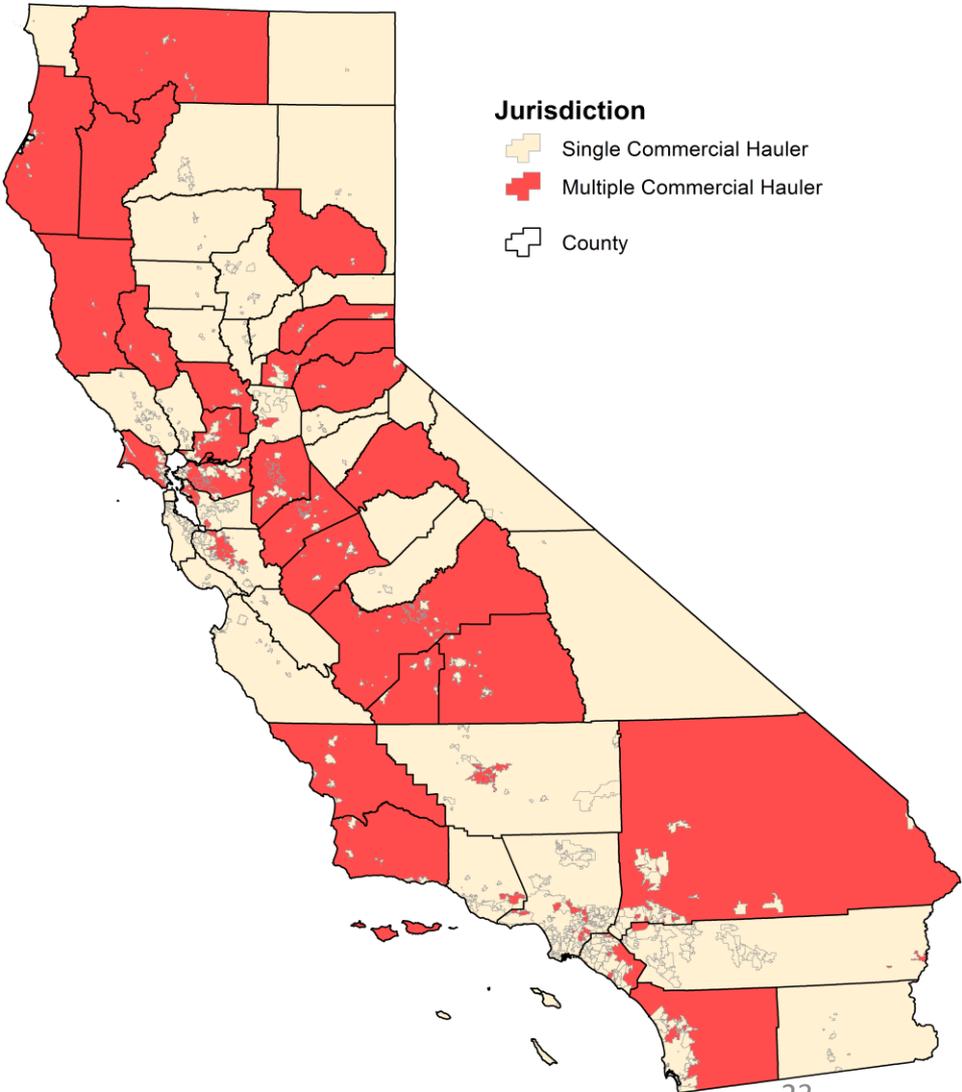


# Most Jurisdictions Contract with 1 Hauler

## Residential



## Commercial



# Top 10 Haulers Serving Jurisdictions

(Preliminary Data)

## Residential

## Commercial

### Residential Haulers By Jurisdiction

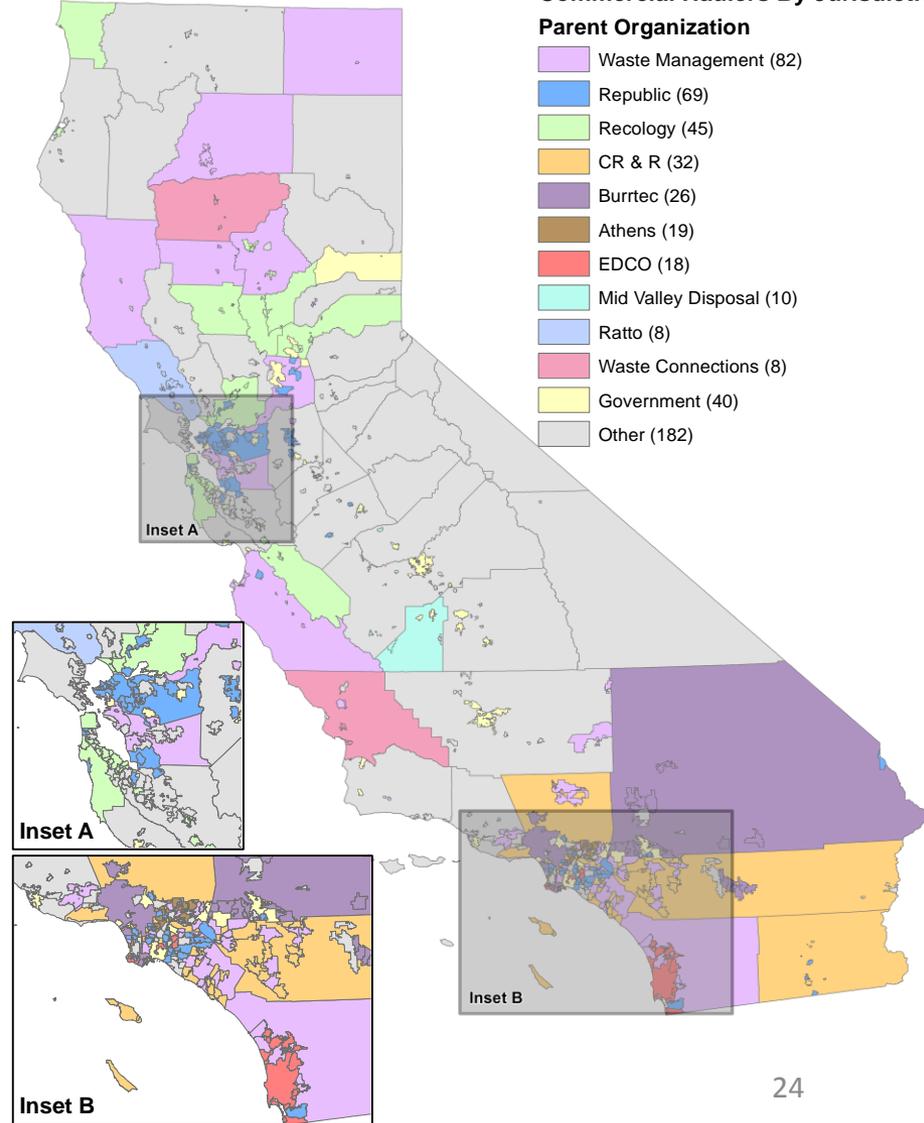
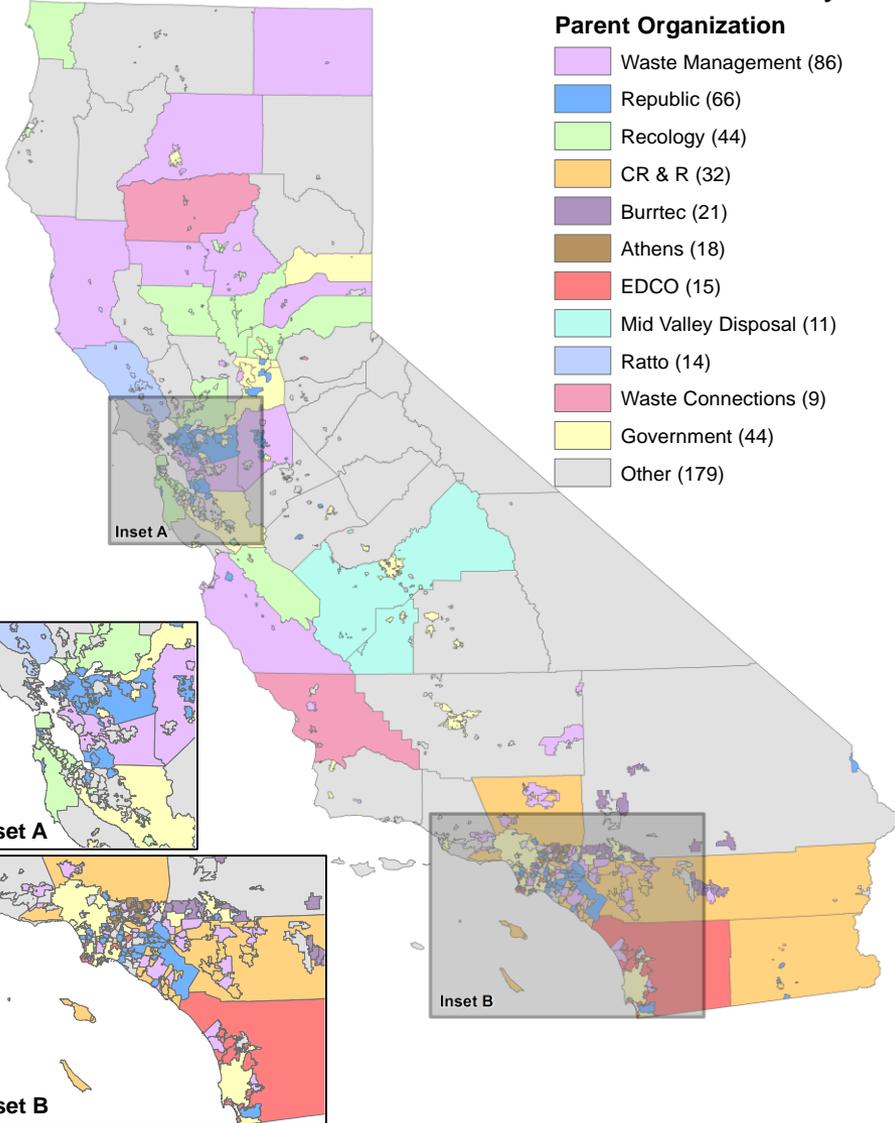
#### Parent Organization

- Waste Management (86)
- Republic (66)
- Recology (44)
- CR & R (32)
- Burrtec (21)
- Athens (18)
- EDCO (15)
- Mid Valley Disposal (11)
- Ratto (14)
- Waste Connections (9)
- Government (44)
- Other (179)

### Commercial Haulers By Jurisdiction

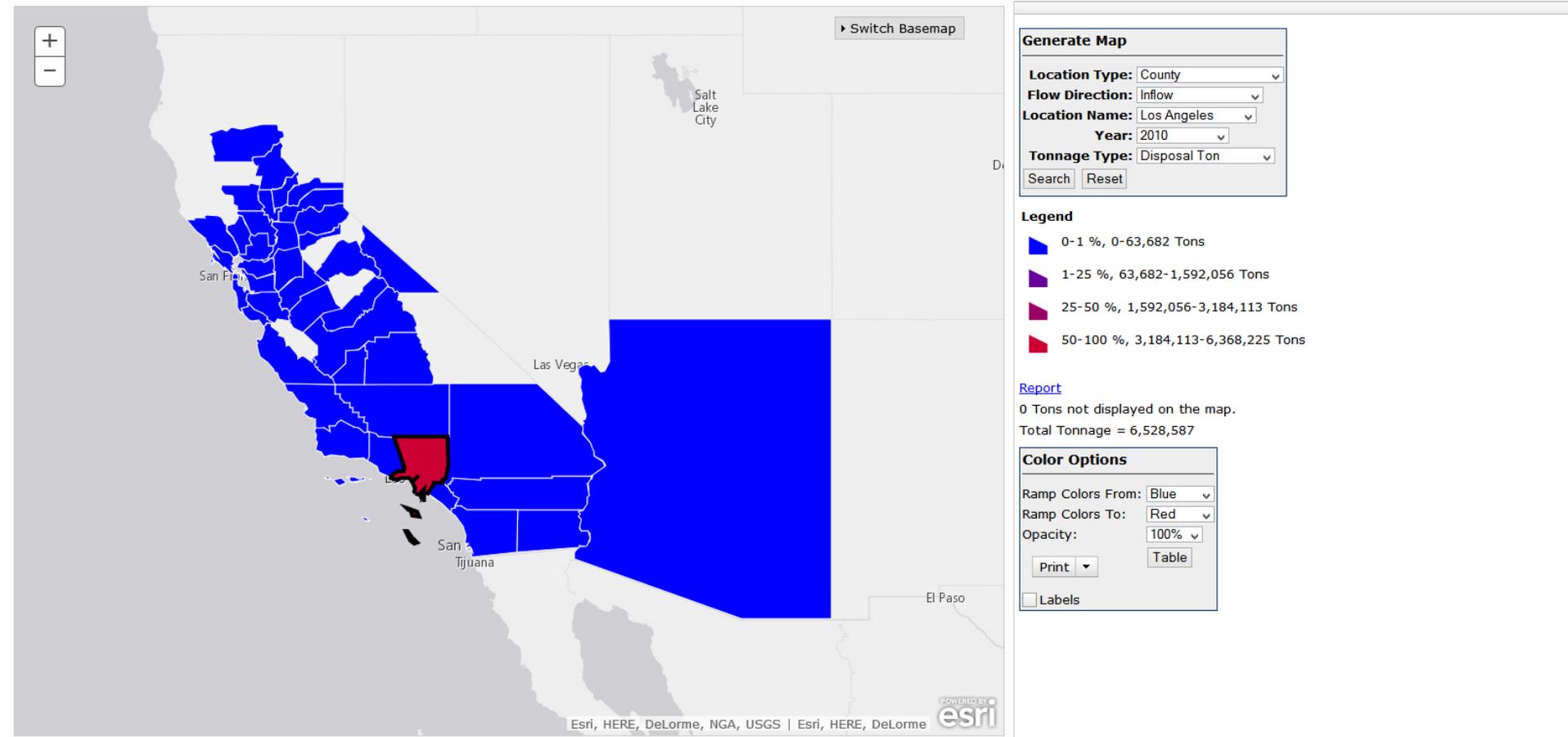
#### Parent Organization

- Waste Management (82)
- Republic (69)
- Recology (45)
- CR & R (32)
- Burrtec (26)
- Athens (19)
- EDCO (18)
- Mid Valley Disposal (10)
- Ratto (8)
- Waste Connections (8)
- Government (40)
- Other (182)



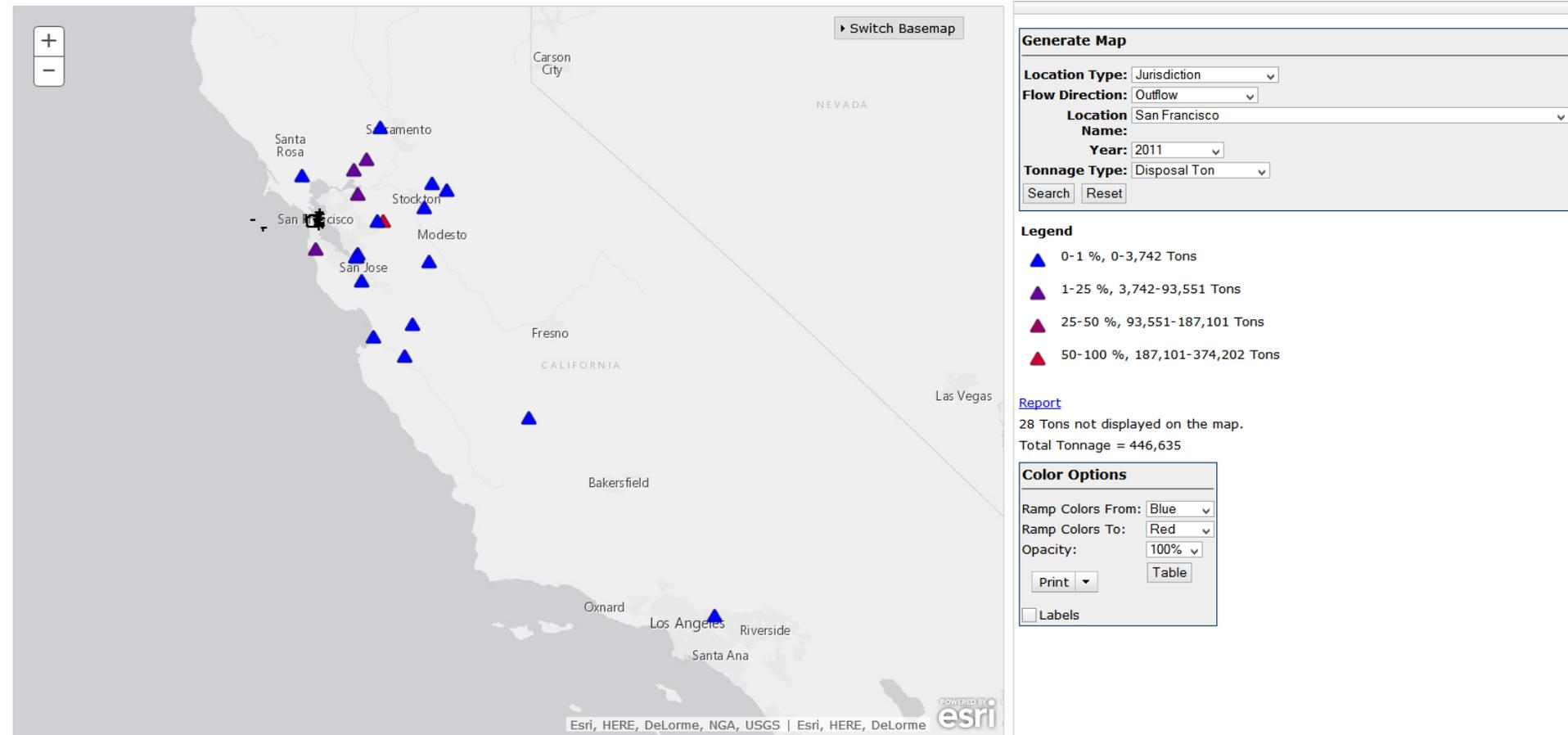
# New Disposal Flow Tool on CalRecycle Website. Example 1: County Inflows

## DRS Inflow Outflow Maps



# New Disposal Flow Tool on CalRecycle Website. Example 2: Jurisdiction Outflows

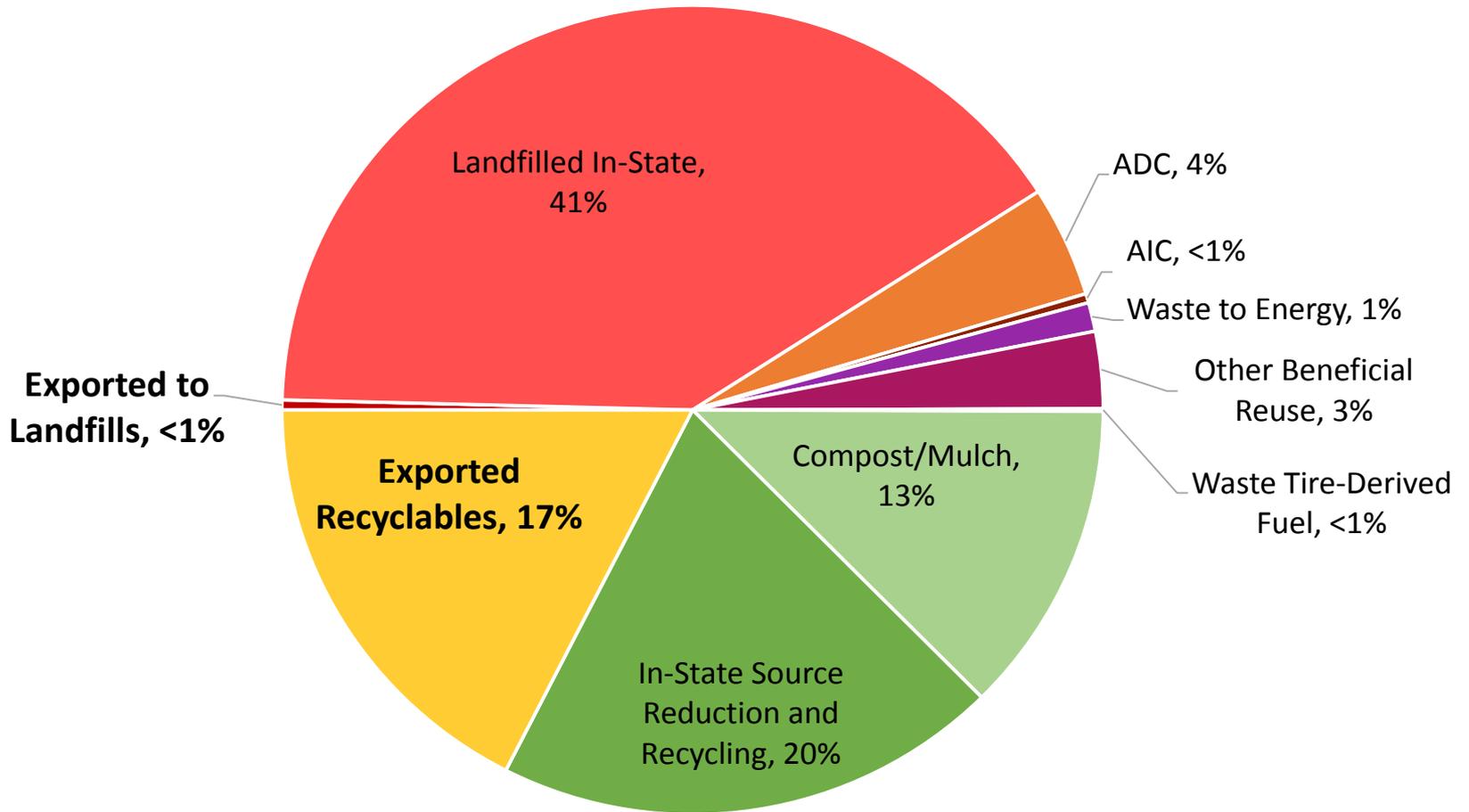
## DRS Inflow Outflow Maps



# Imports and Exports

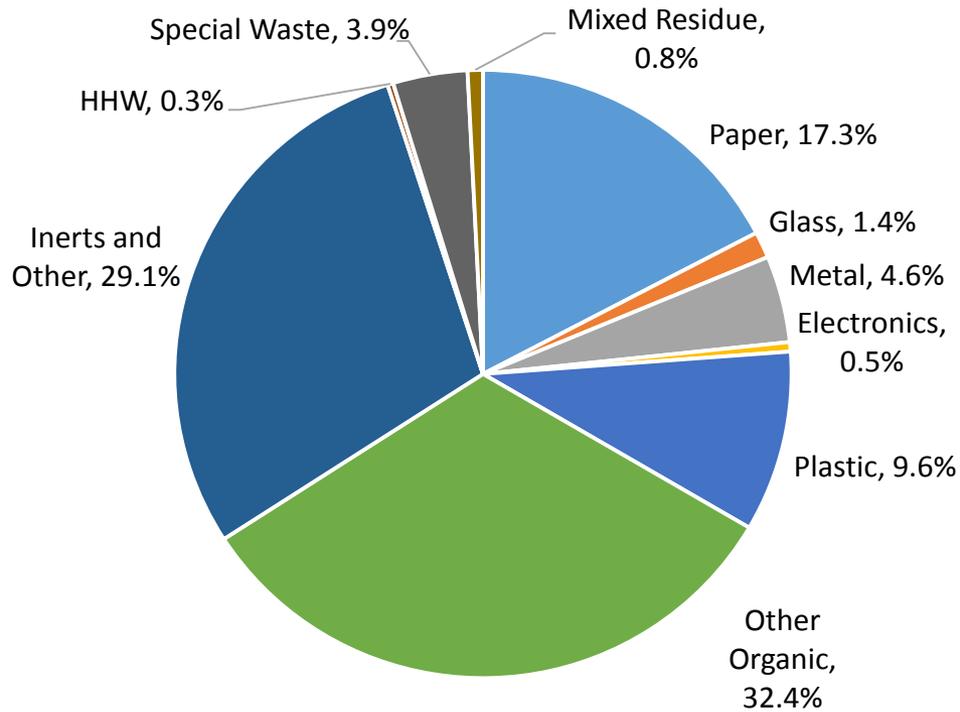
- Solid Waste
  - Waste sent to landfills is tracked
  - Solid waste imports account for less than 1% of all waste
  - About 1% of solid waste was exported in 2013 from border counties to Oregon, Nevada, and Arizona
- Recyclables
  - Recycling is not tracked
  - 18.6 million tons of recyclables exported by California sea ports in 2013 (~70% originates in-state)
  - Initial Imported Material Reports show at least 46,000 tons of imported recyclables from Mar-Dec 2014

# Exported Waste and Recyclables



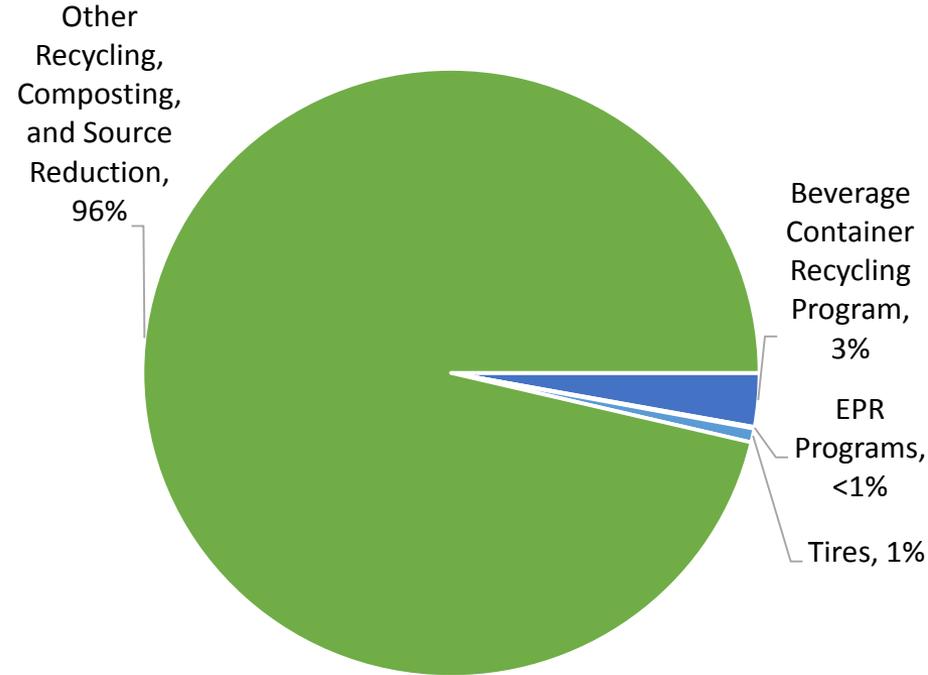
# Composition of Waste Stream

## Disposal



2008 Waste Characterization Study

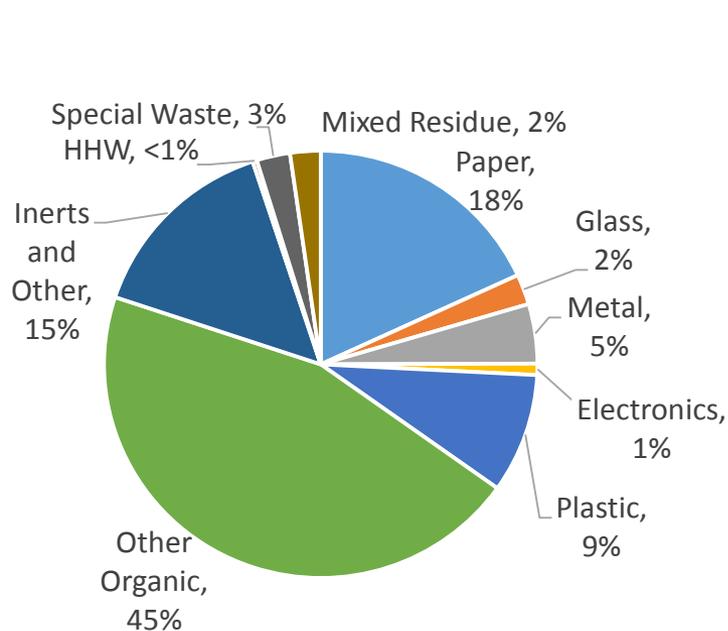
## Recycling



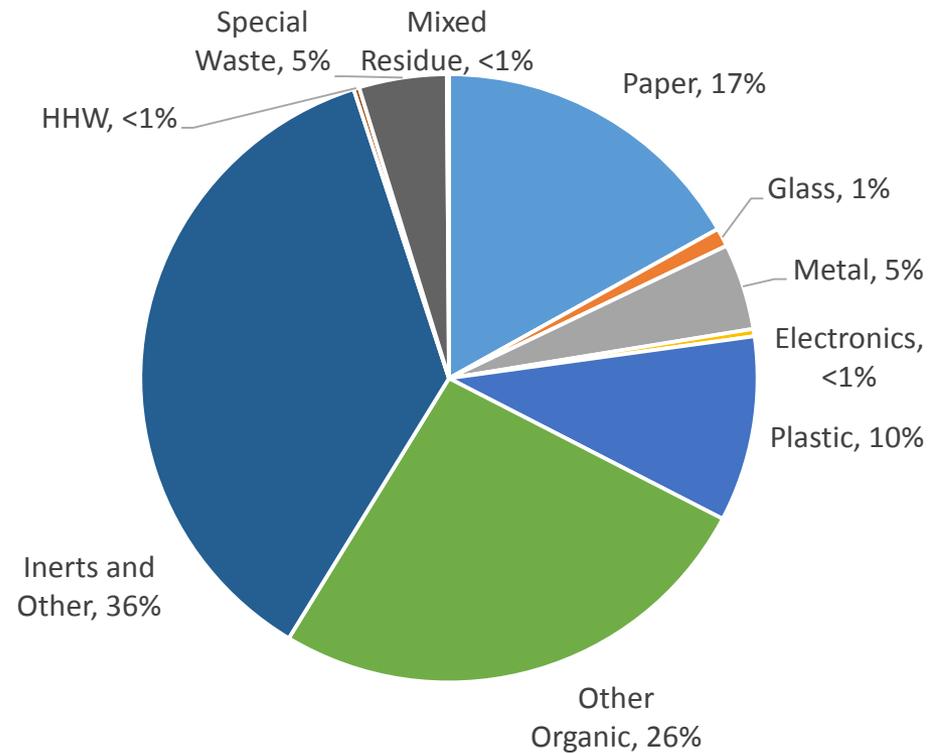
2013 Reported Materials

# Waste Sectors

## Residential (33%)

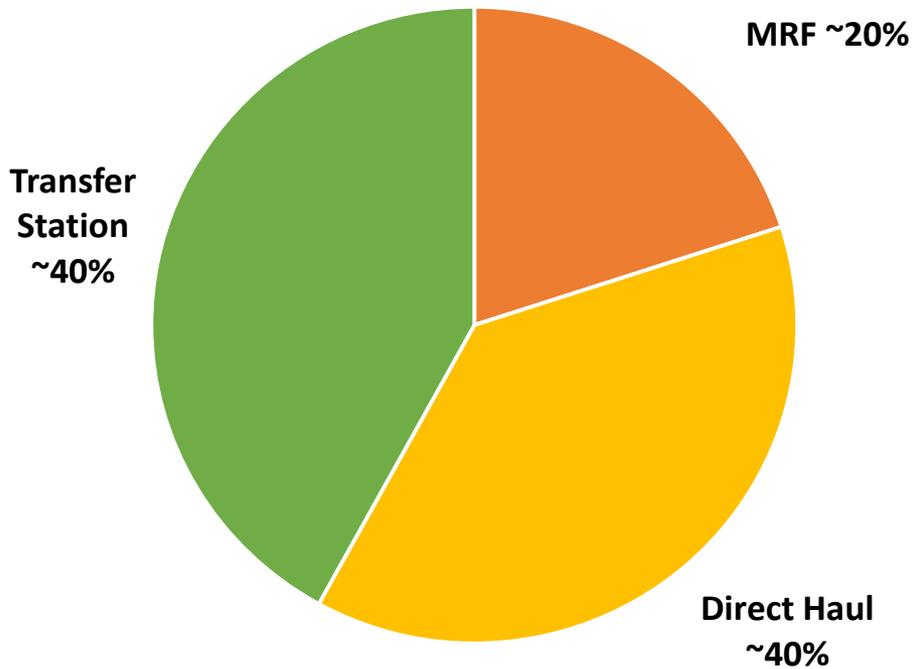


## Commercial (67%)



# Estimated Flow of Waste Stream

## Disposal at Landfills



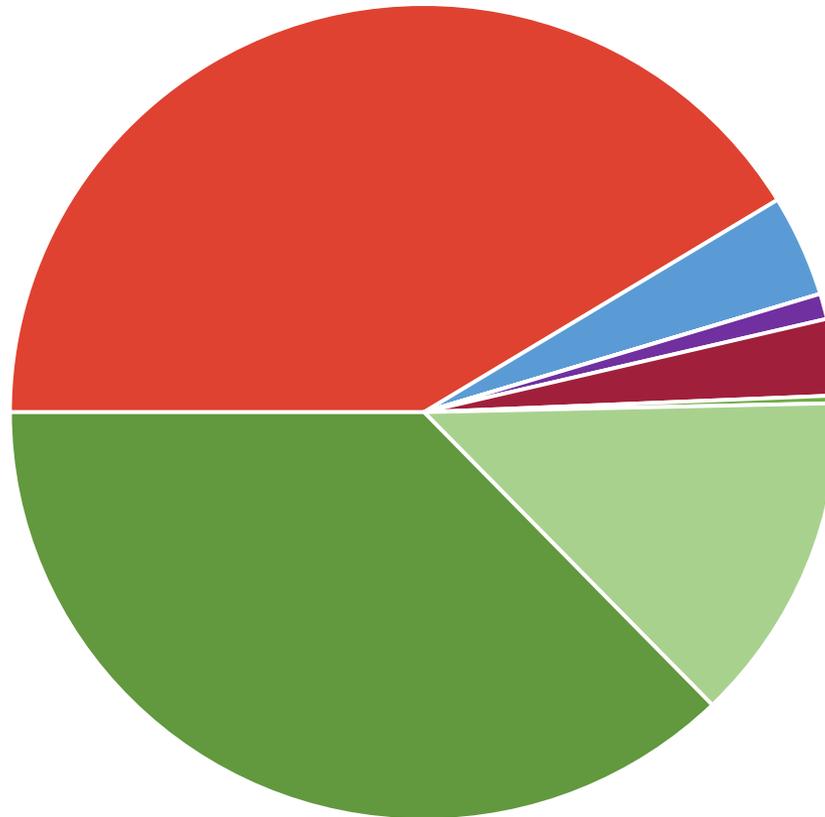
## Recycling



Data from 2008 Waste Characterization Study,  
MRF Study and DRS

# Disposal Issues and Policy Questions

Disposal and Disposal-Related

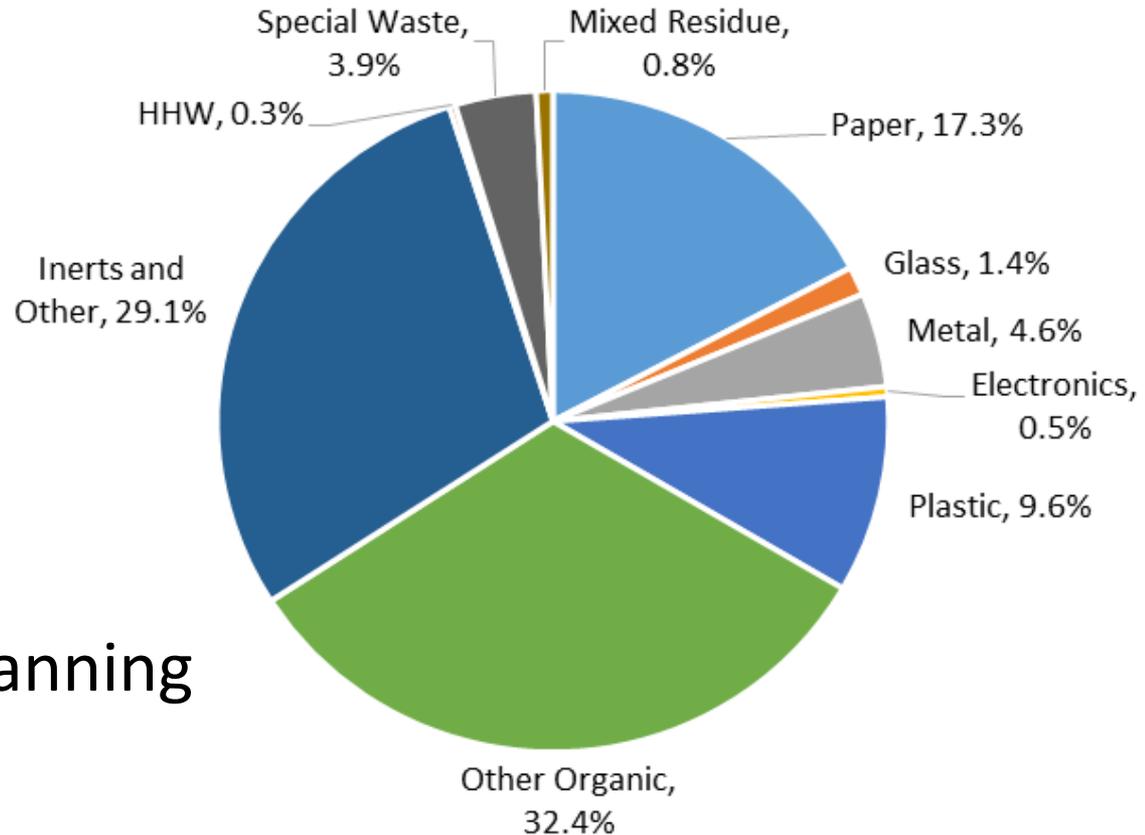


Source Reduction, Recycling, and Compost/Mulch

# Statewide Disposal Questions

- How will we know what is in the waste stream?
- How much will we dispose of?
- Do we have enough landfill capacity to handle it?
- Will the flow of waste affect goal achievement?
- How do disposal-related materials figure into the mix?
- Will the quality of disposal information be good enough for 75% goal measurement?
- What will be the impact of fees and funding on goal measurement and visa versa?

# Waste Composition Data tells us about the Waste Stream



- Policy development
- Diversion program planning
- Market development
- Assessing impacts of laws programs and policies

# Impacts of Study Frequency & Future Studies

## **Frequency**

- Snapshot in time
- Waste stream changes over time
- Old data not as relevant or useful

## **Future Studies**

- 2014 Study completed – Available May 2015
- 2017 Mid-course review?
- 2020 Study planned to assess progress

# Landfill Disposal Capacity

- By region, do we have enough annual landfill capacity to handle disposal from year to year?
- By region, do we have enough available lifetime capacity to handle disposal in the near future?
- How many years of available lifetime landfill capacity does California and each region have?

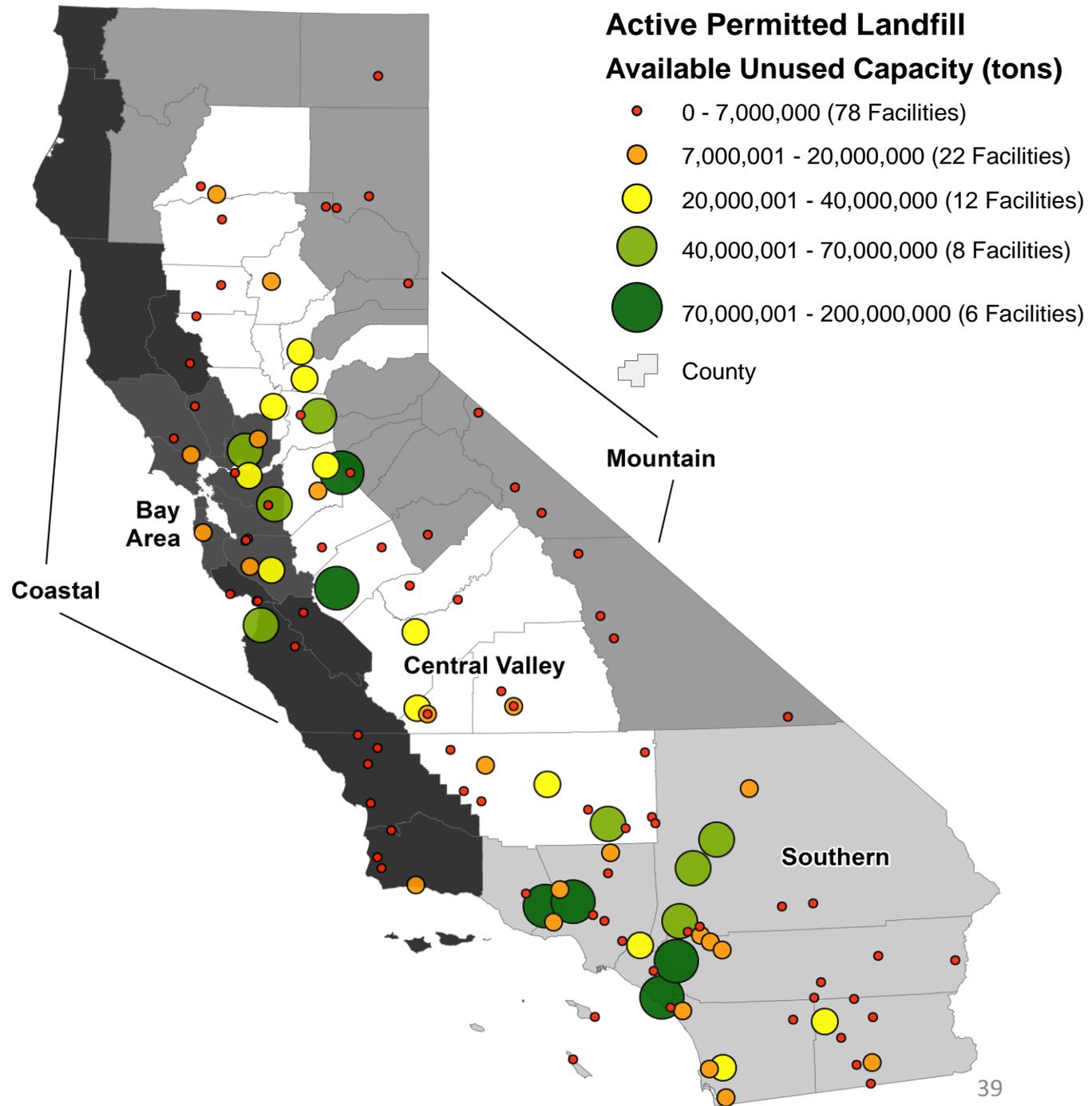
# Most regions have adequate annual landfill capacity

Region	2013 Population	Per Capita Annual Capacity in Tons per Year	Per Capita Disposal in Tons per Year
Bay Area	7,390,000	2.03	0.78
Central Valley	6,710,000	3.69	0.85
Coastal	1,770,000	2.39	0.84
Mountain	590,000	1.23	1.28
Southern	21,700,000	1.93	1.01
Statewide	38,160,000	2.27	0.93

# Most Regions have at Least 40 Years of Remaining Lifetime Capacity

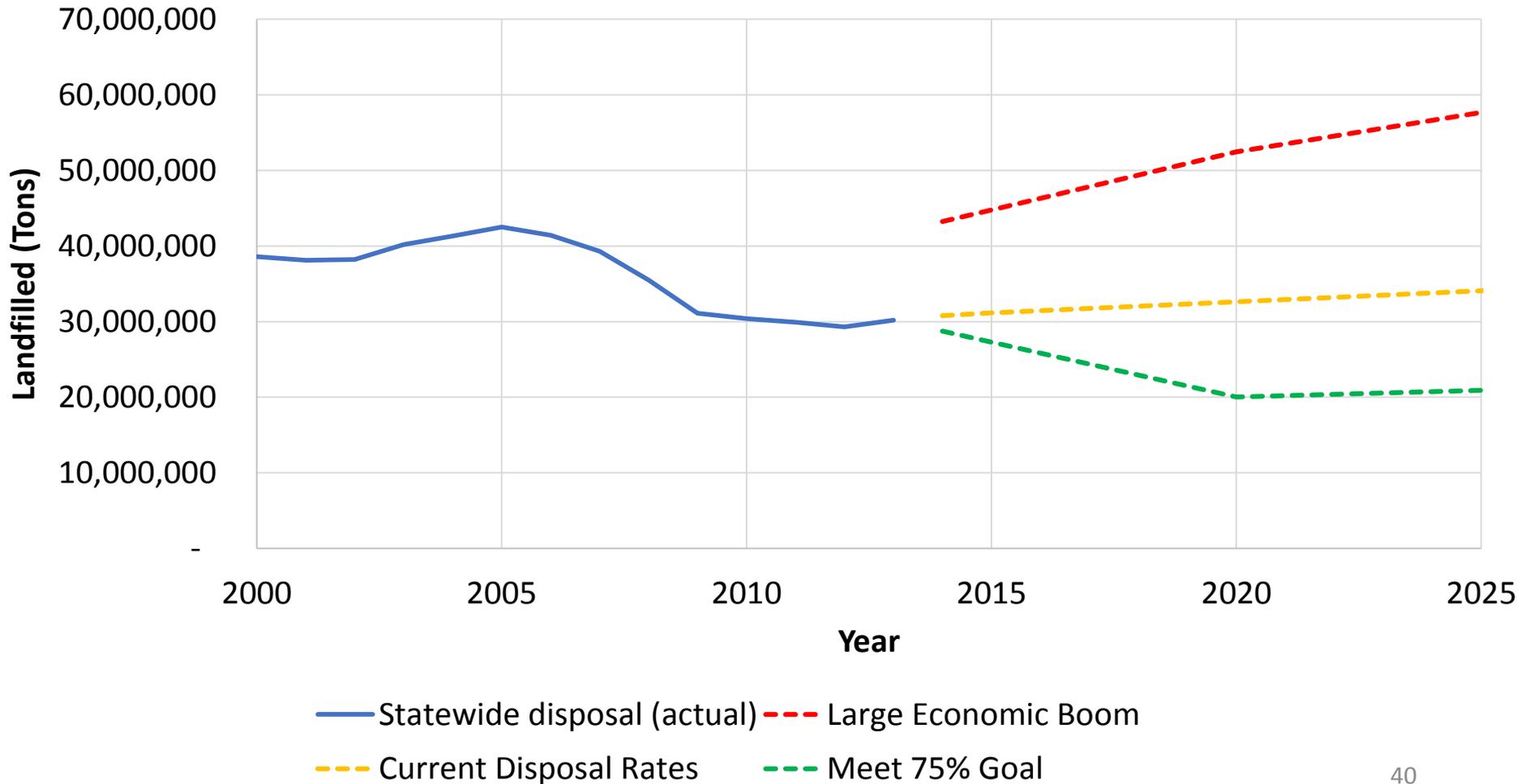
Region	2013 Population	Disposal (million tons)	Total Remaining Capacity (million tons)	Years of Landfill Space
Bay Area	7,390,000	4.9	218	44
Central Valley	6,710,000	5.0	600	121
Coastal	1,770,000	1.3	106	81
Mountain	590,000	0.6	11	18
Southern	21,700,000	19.4	793	41

Most regions currently have plenty of available unused lifetime capacity

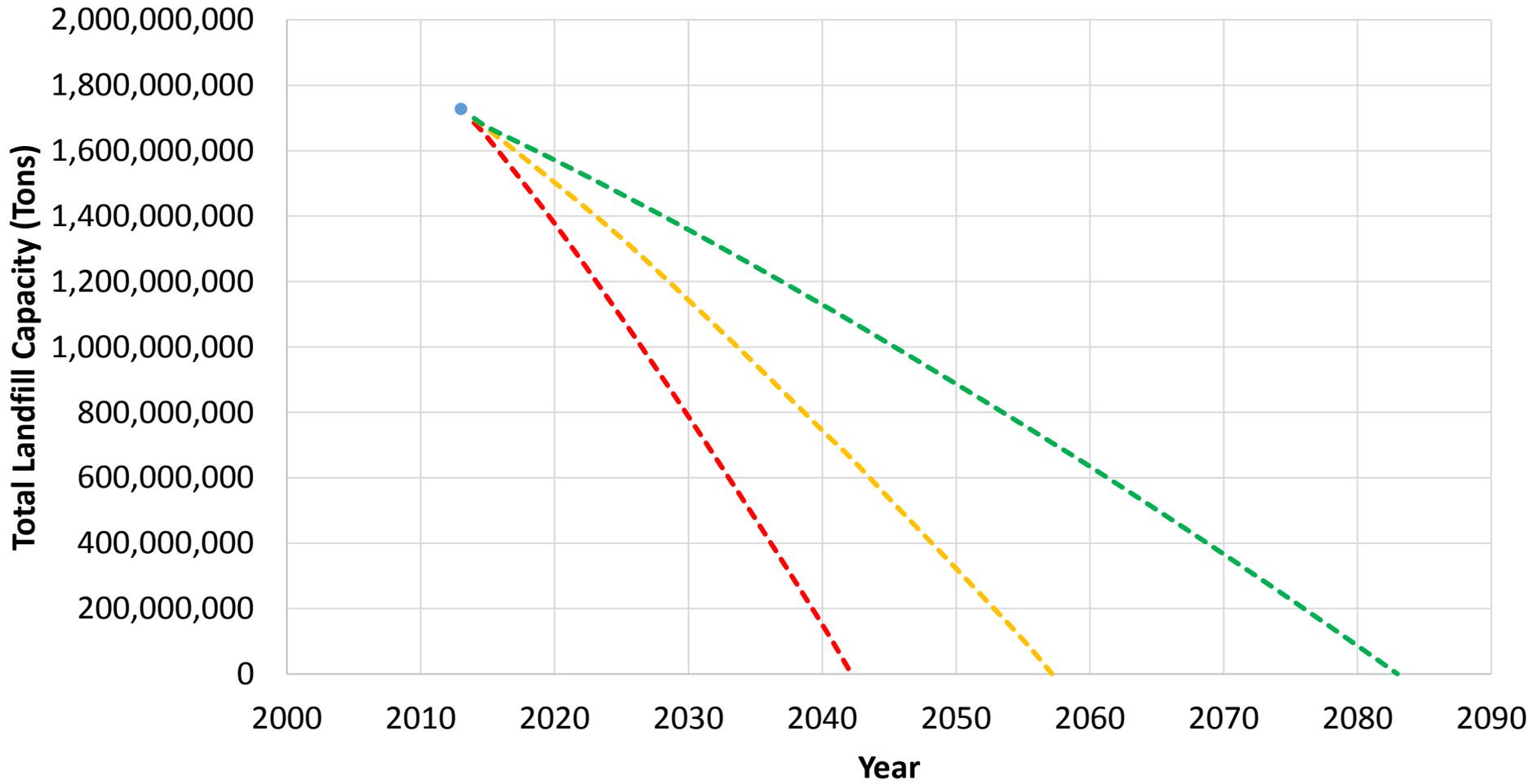


# How much will we dispose of: three scenarios

## Statewide Disposal Projections through 2025



# 68 years of capacity if we achieve 75% Recycling

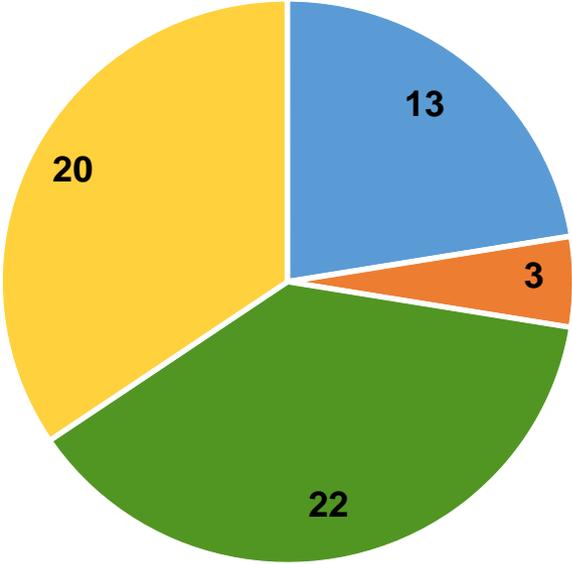


● Capacity (historical) - - Large Economic Boom - - Current Disposal Rates - - Meet 75% Goal

# Waste Flows

- Where is waste generated?
- How far does waste travel to get to its final destination?
- Why does waste flow the way it does?

# Waste flows from county to county



- 100% Waste Sent outside of County
- 51-99.9%
- 6-50.9%
- Greater than 0 to 5.9%

# Reasons for waste flows

- Availability of Facilities
- Daily Limits on Facility Throughput
- Material Types Accepted
- Geography
- Local Ordinances
- Vertical Integration of Waste Companies
- Disposal Costs

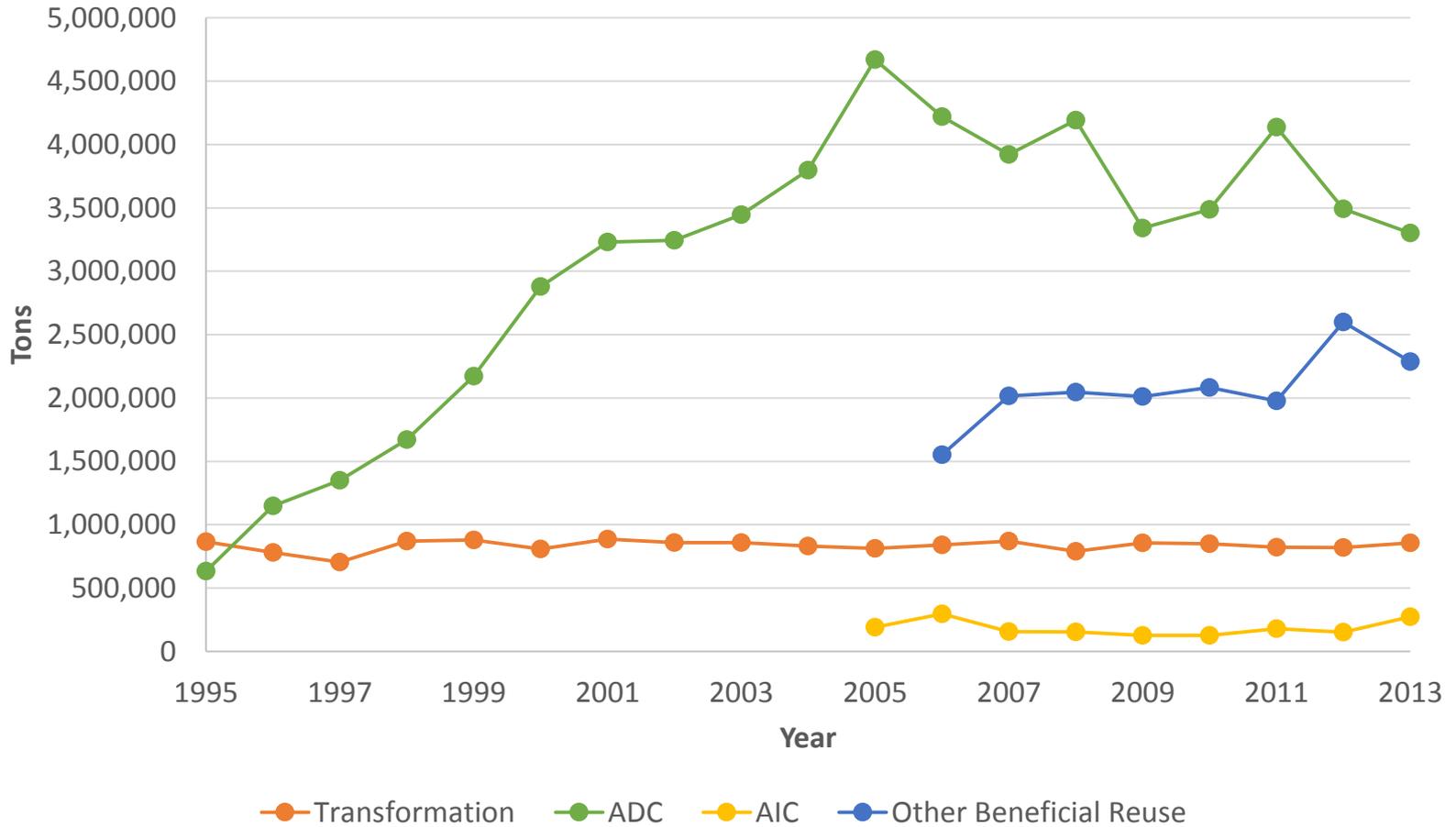
# Disposal-Related Activities

- How much disposal-related activity is there?
- How will disposal-related activity impact the 75% goal?

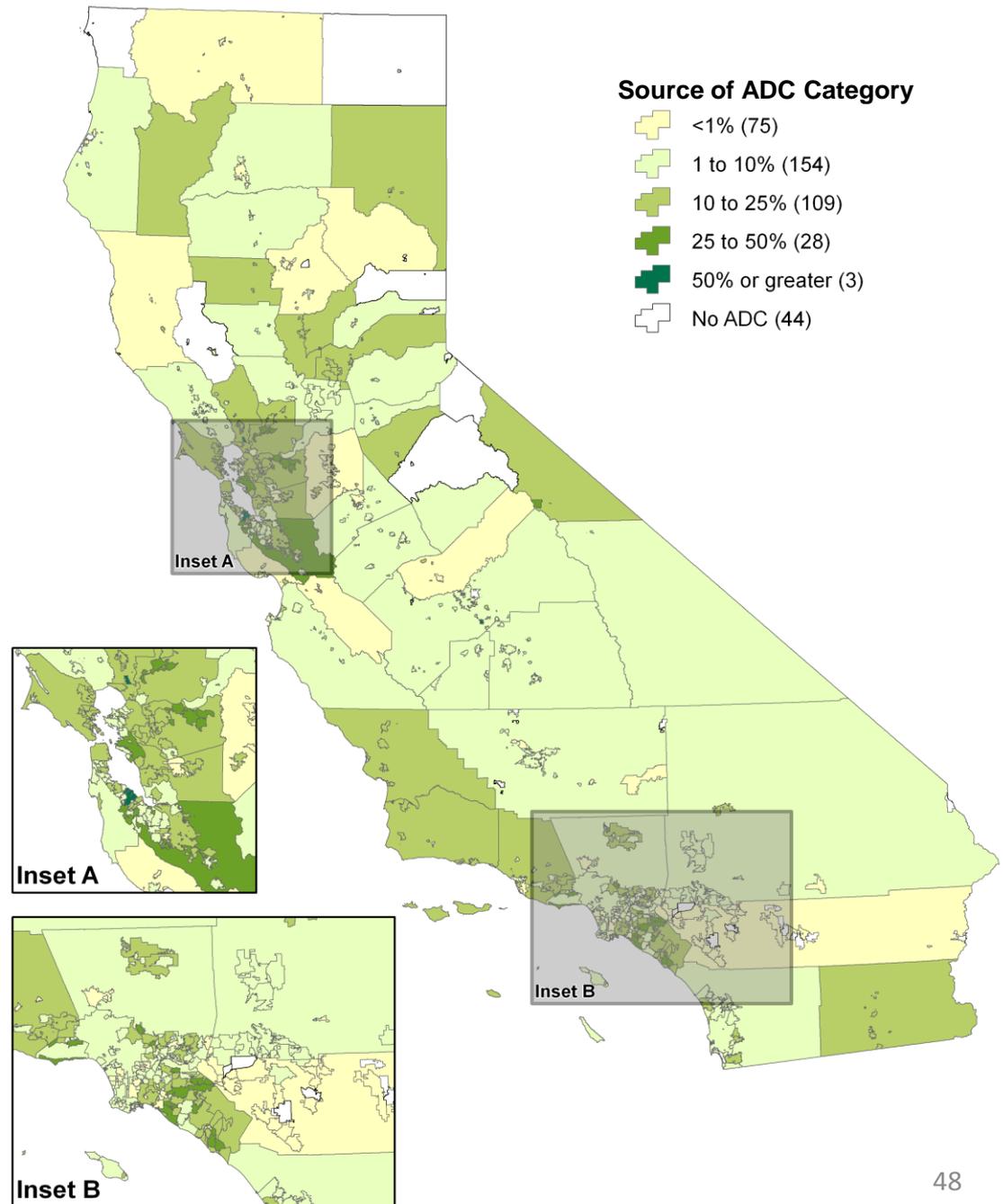
# Monitoring Disposal-Related Activities

- 6.7 million tons of material went to disposal-related activities in 2013, including:
  - Alternative daily cover
  - Other beneficial reuse
  - Transformation and waste derived fuels
  - Alternative intermediate cover

# Disposal-Related Activity

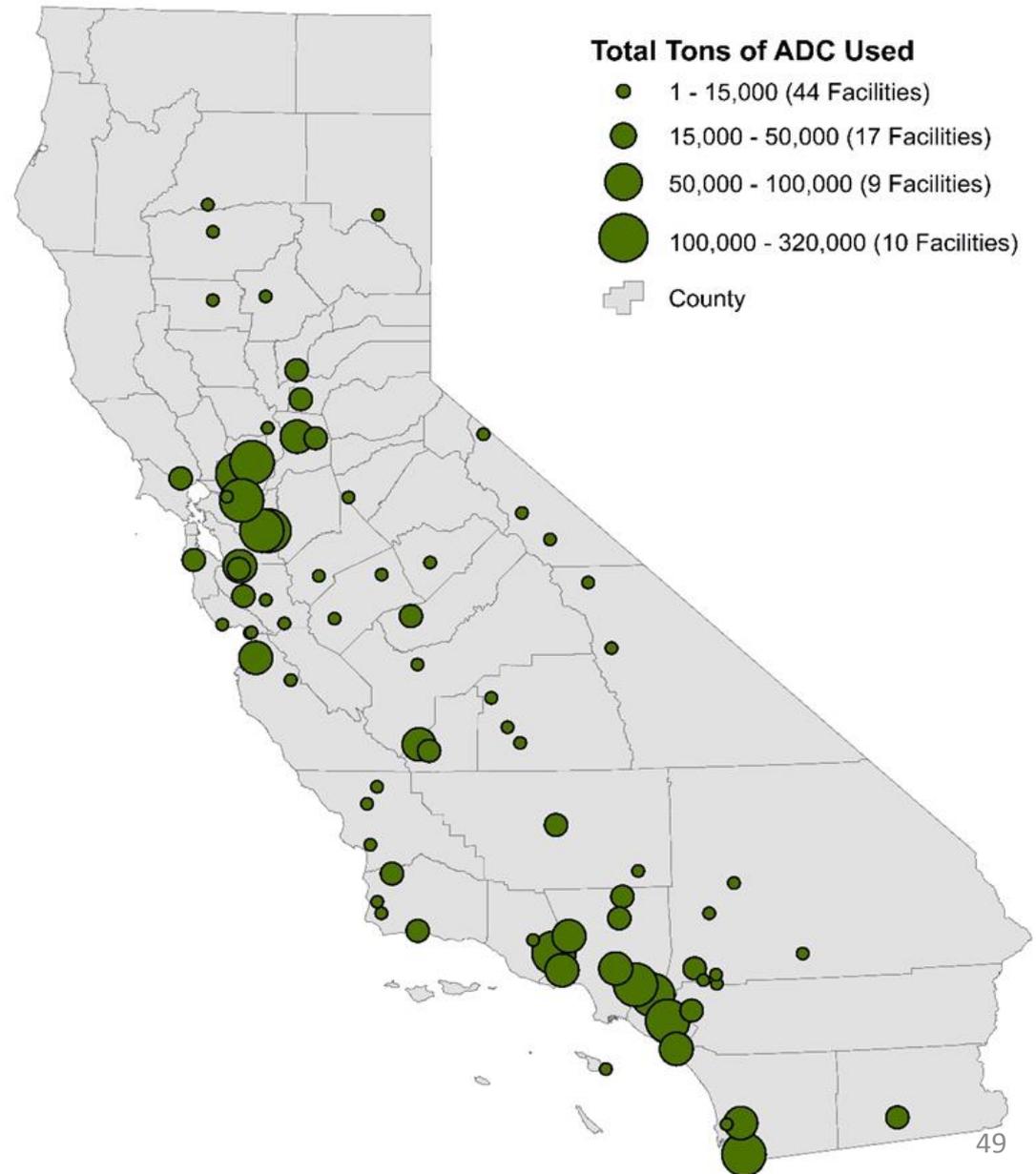


# ADC Comes from Many Jurisdictions

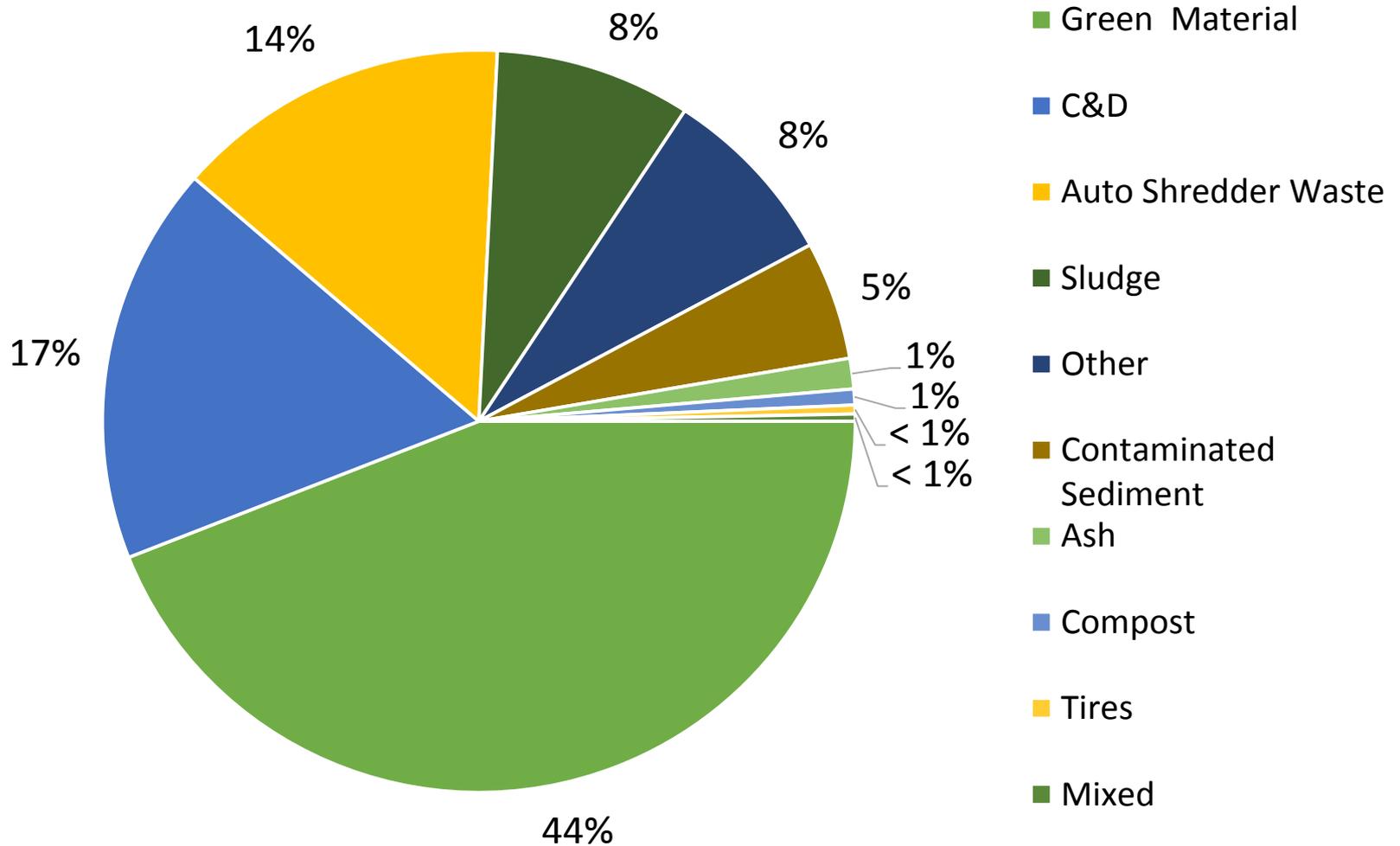


ADC use is primarily in the Southern Region and the Bay Area

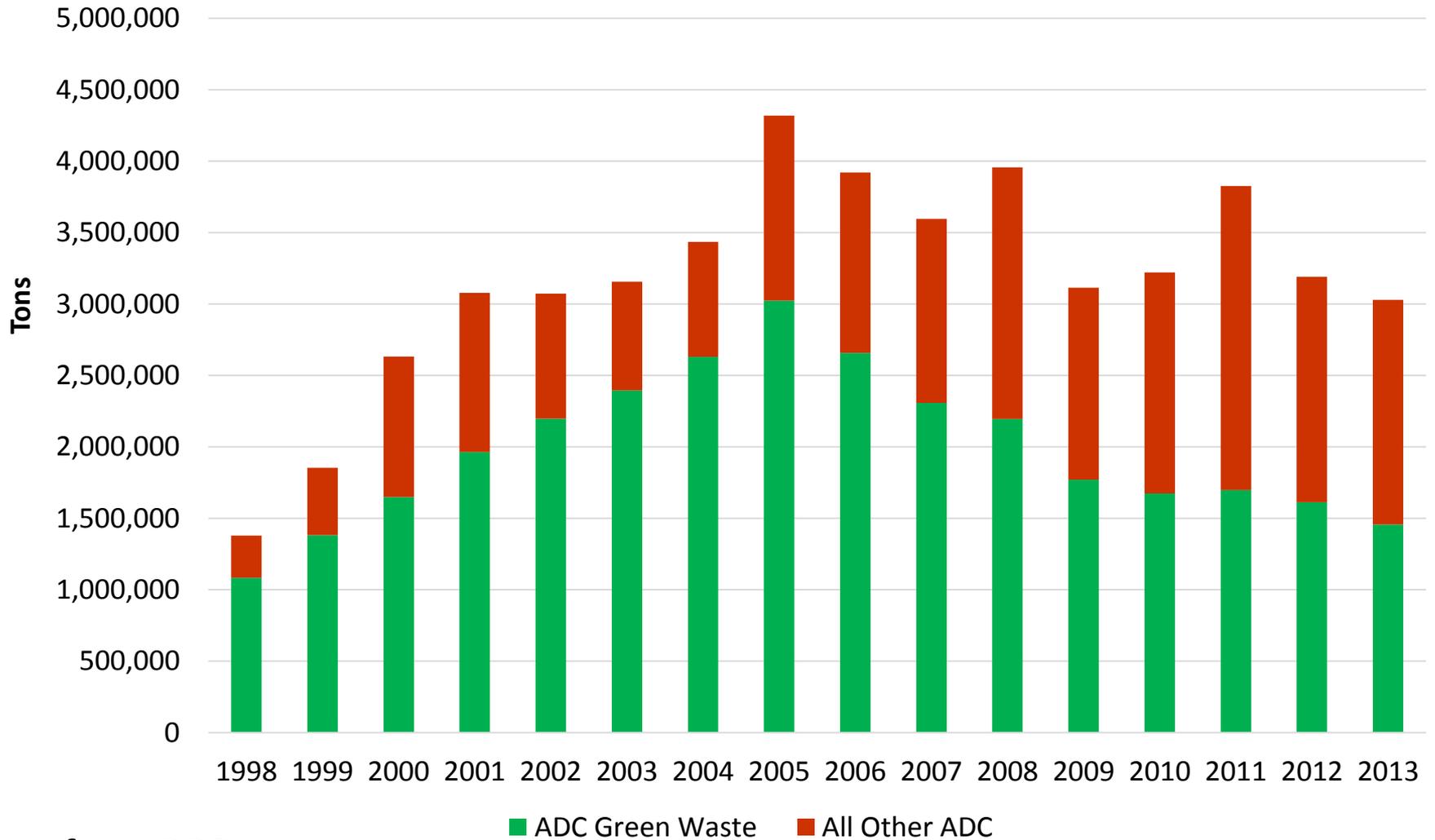
Total ADC Tons at Landfills, 2013



# Top 3 Material Types – Green Waste, C&D and Auto Shredder Fluff (2013)

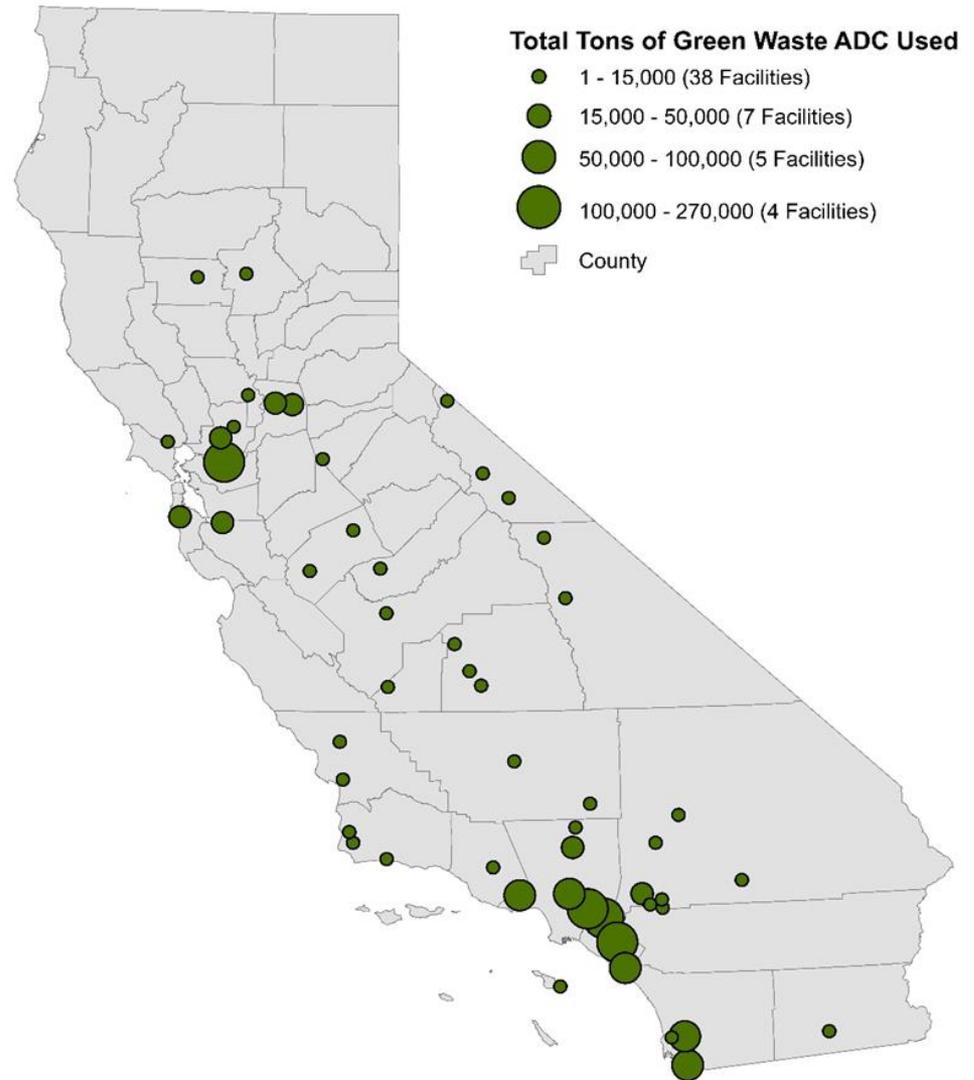


# Green Waste is the Most Used Material But has Declined

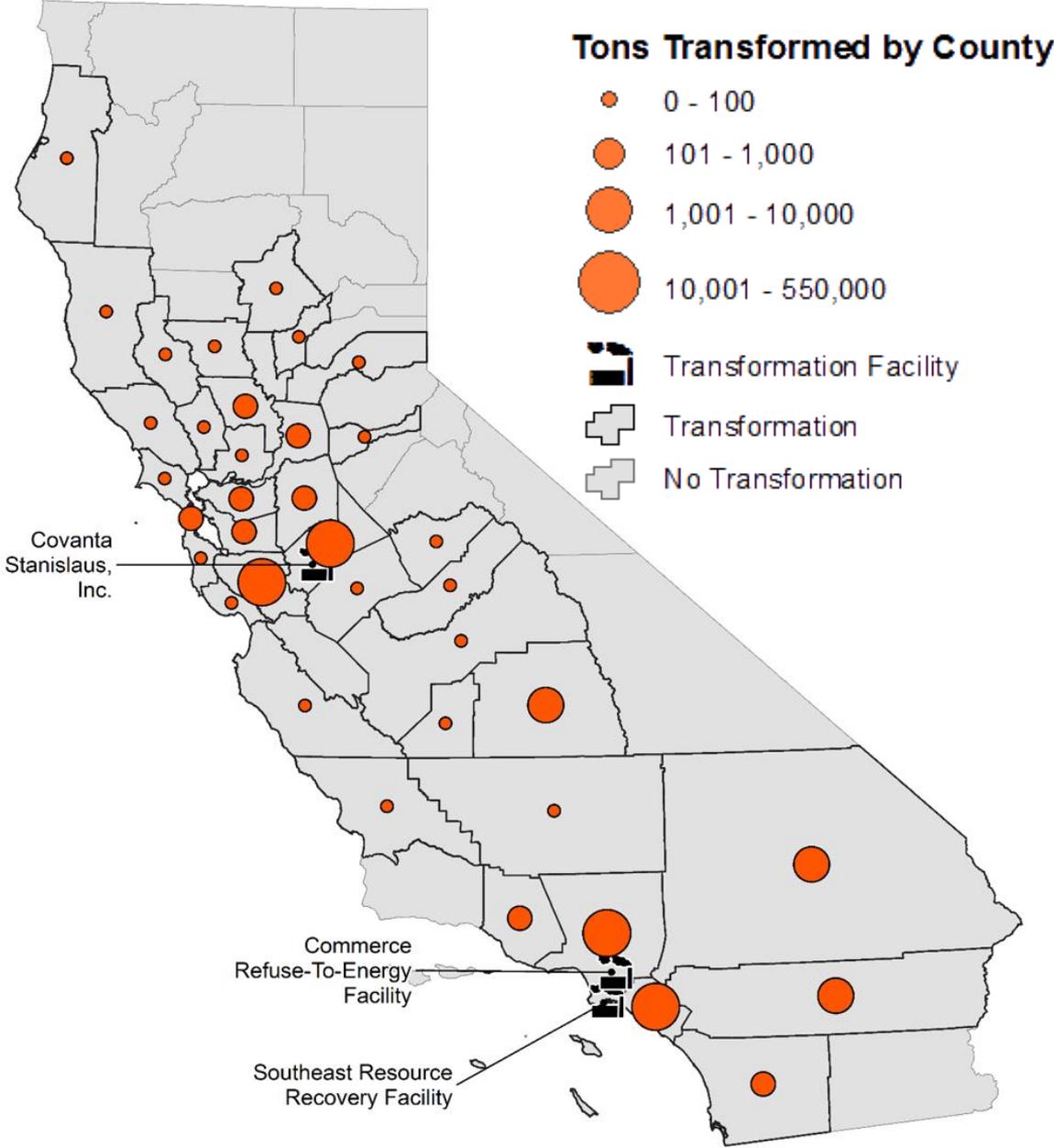


Data from DRS

2/3 of Green Waste ADC Use is in the Southern Region

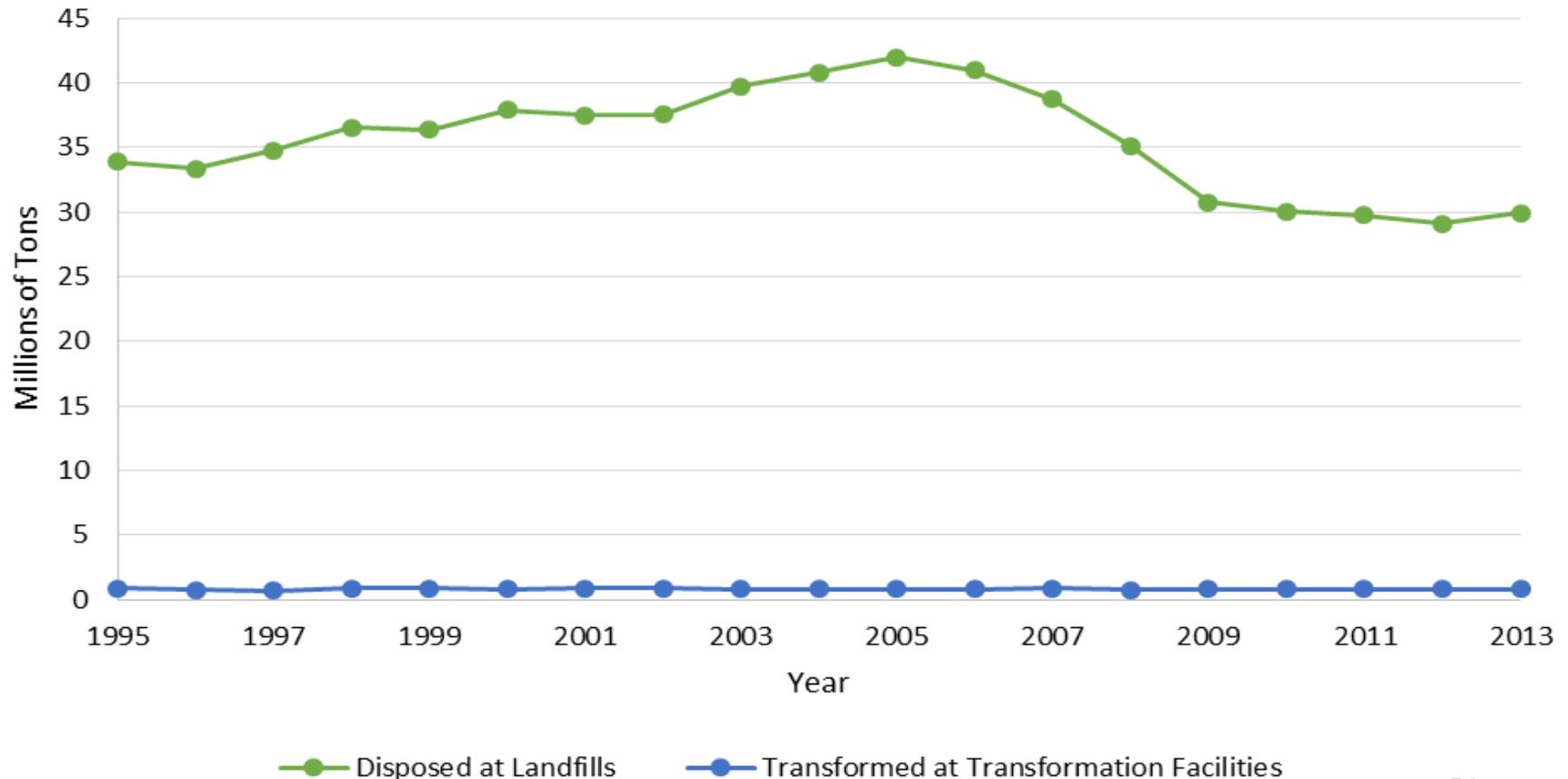


Counties near transformation facilities use transformation the most

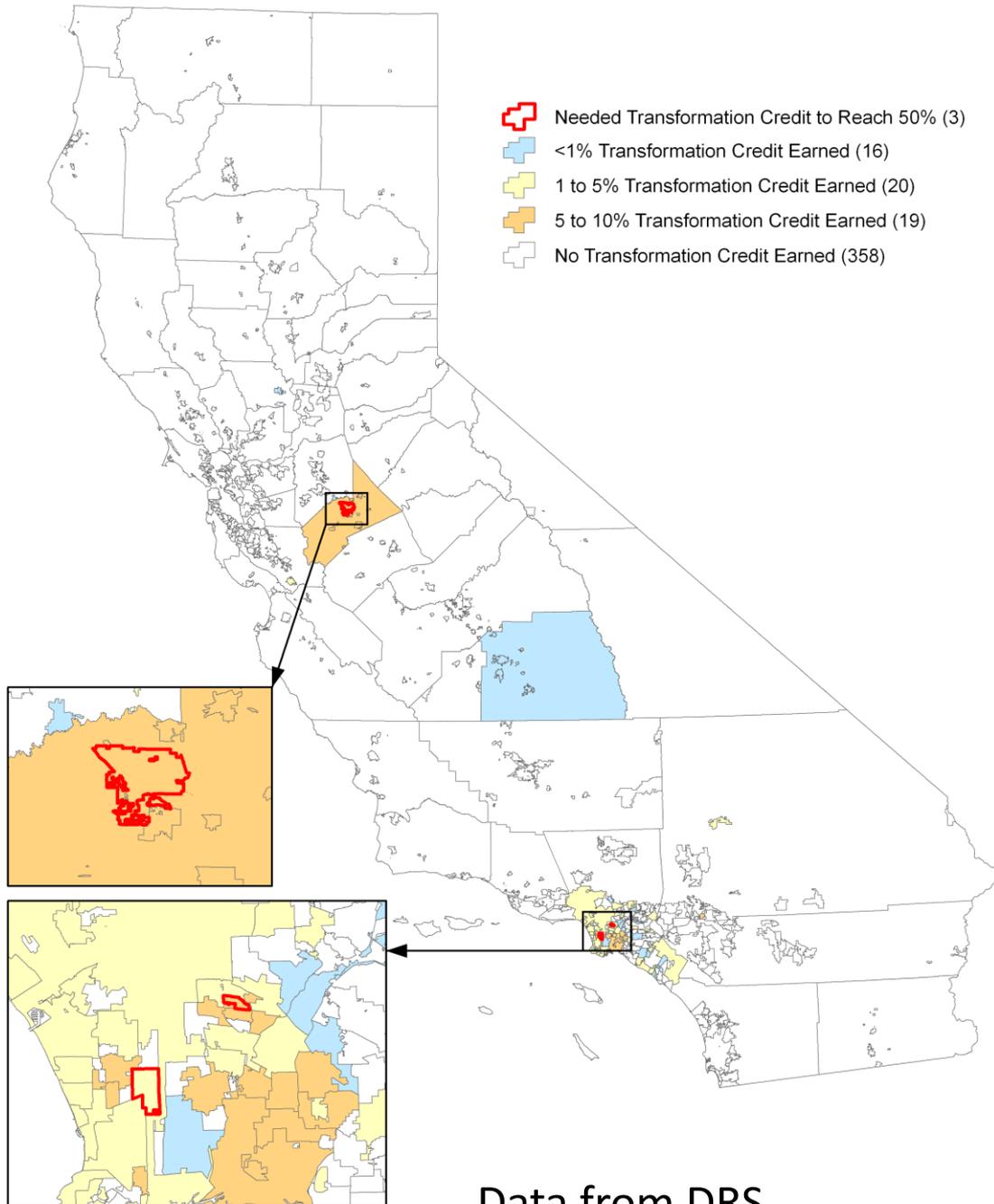


# Transformation Use Has Remained Steady

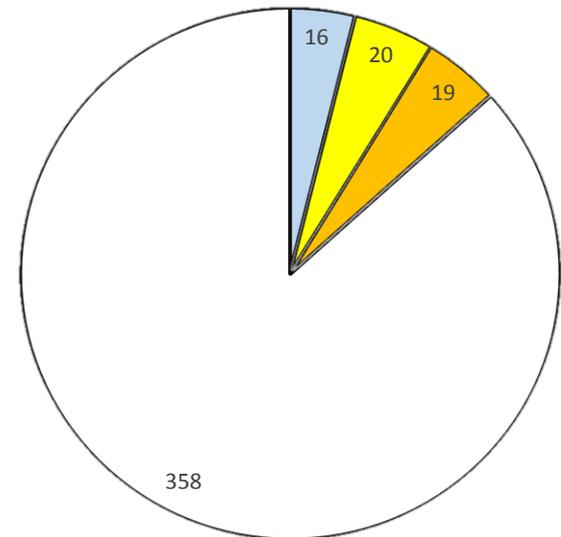
Transformed and Landfilled 1995-2013



# Few Jurisdictions Need Transformation Credit under AB939



Count of Jurisdictions getting Transformation Credits in 2013



Data from DRS

# Compliance Issues with DRS reporting



# DRS Data Quality Options

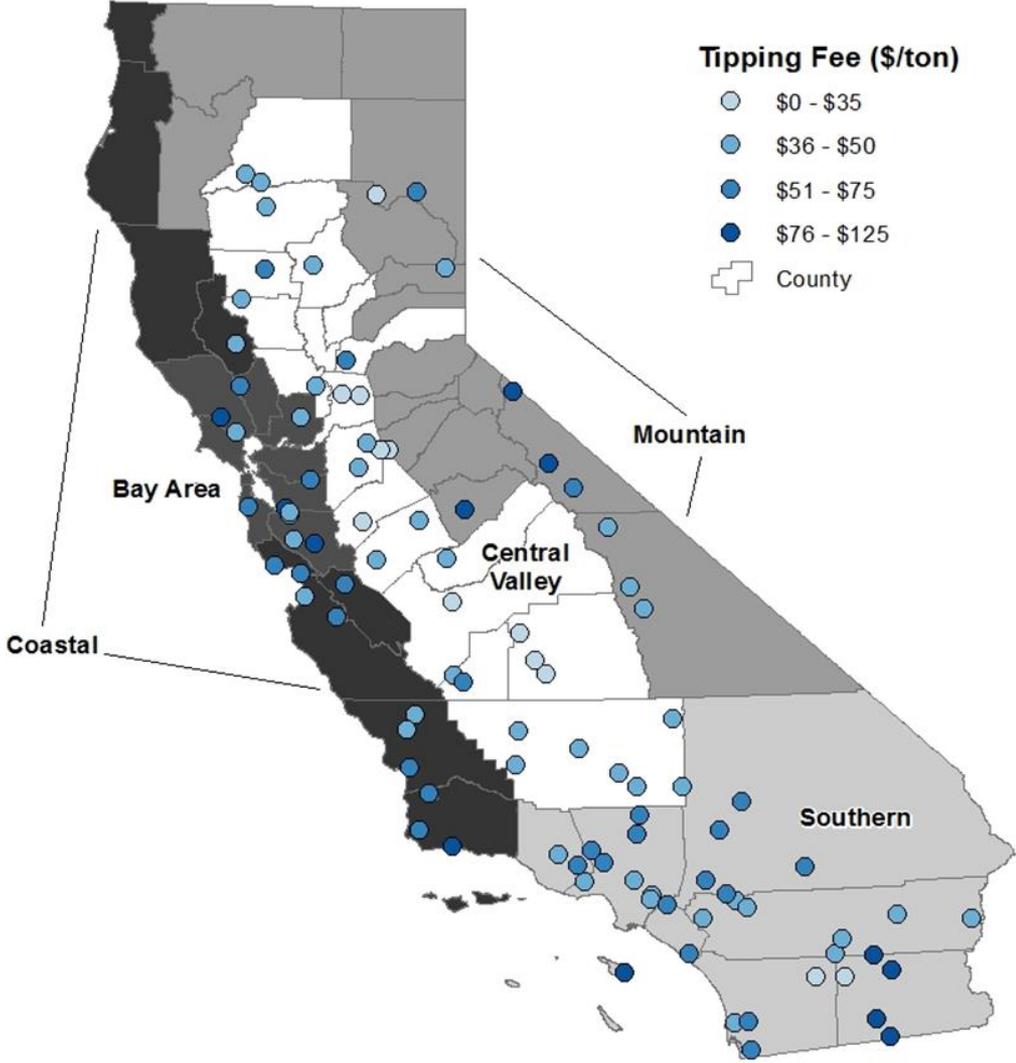
- No meaningful DRS enforcement options
- No monetary penalties or other mechanisms
- We continue to work hard to get better data

# Disposal Fees and Funding

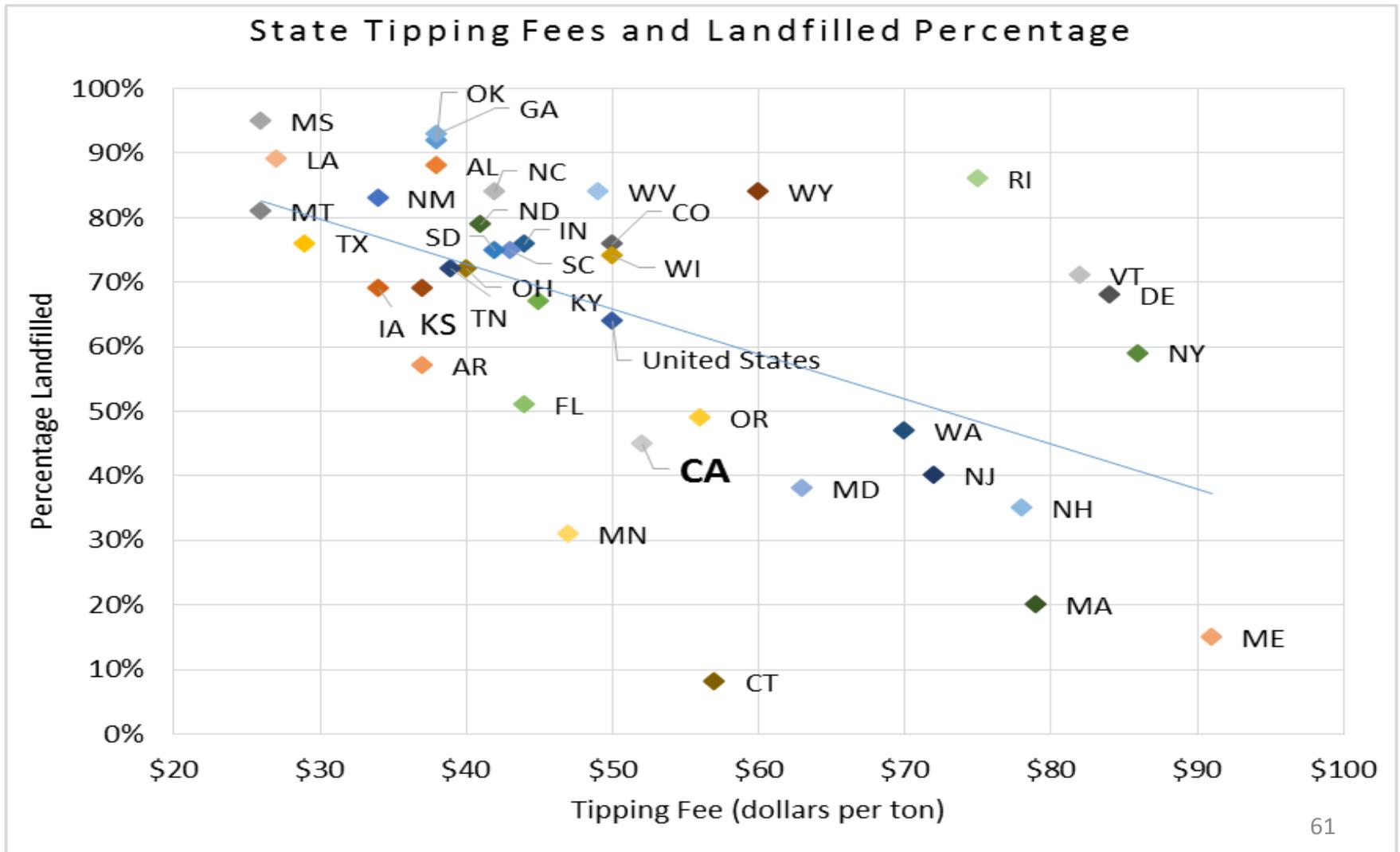
- How do landfill tipping fees in California compare to other states?
- What is the Integrated Waste Management Fee and how does it impact CalRecycle's funding?
- How do other states fund their solid waste and recycling programs?

# Publically Posted Tipping Fees Vary Regionally

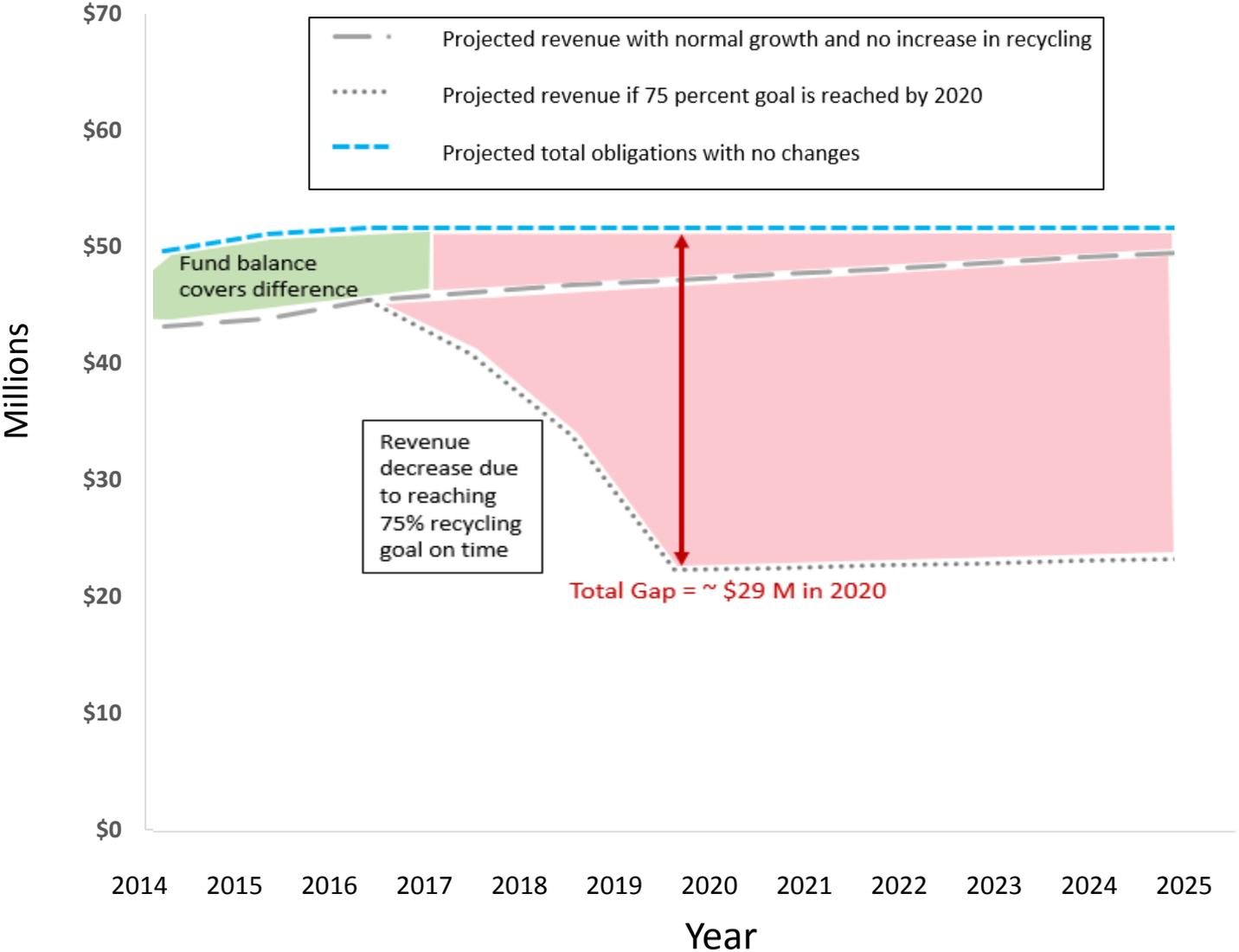
## Tipping Fees in California, 2013 Regional Data



# Lower Tipping Fees mean Higher Landfill%

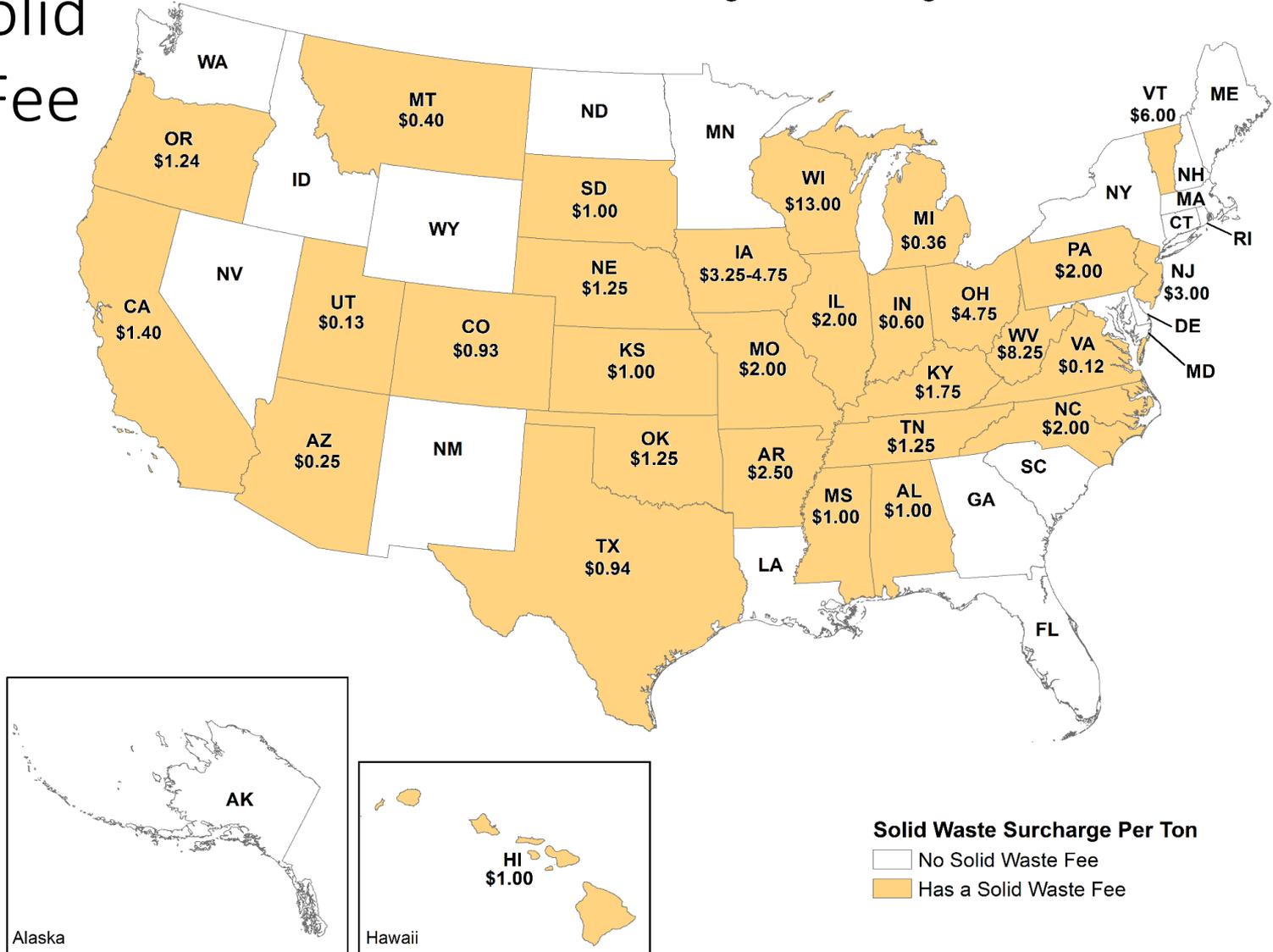


# CalRecycle Funding Scenario if 75% Statewide Recycling Goal Met in 2020



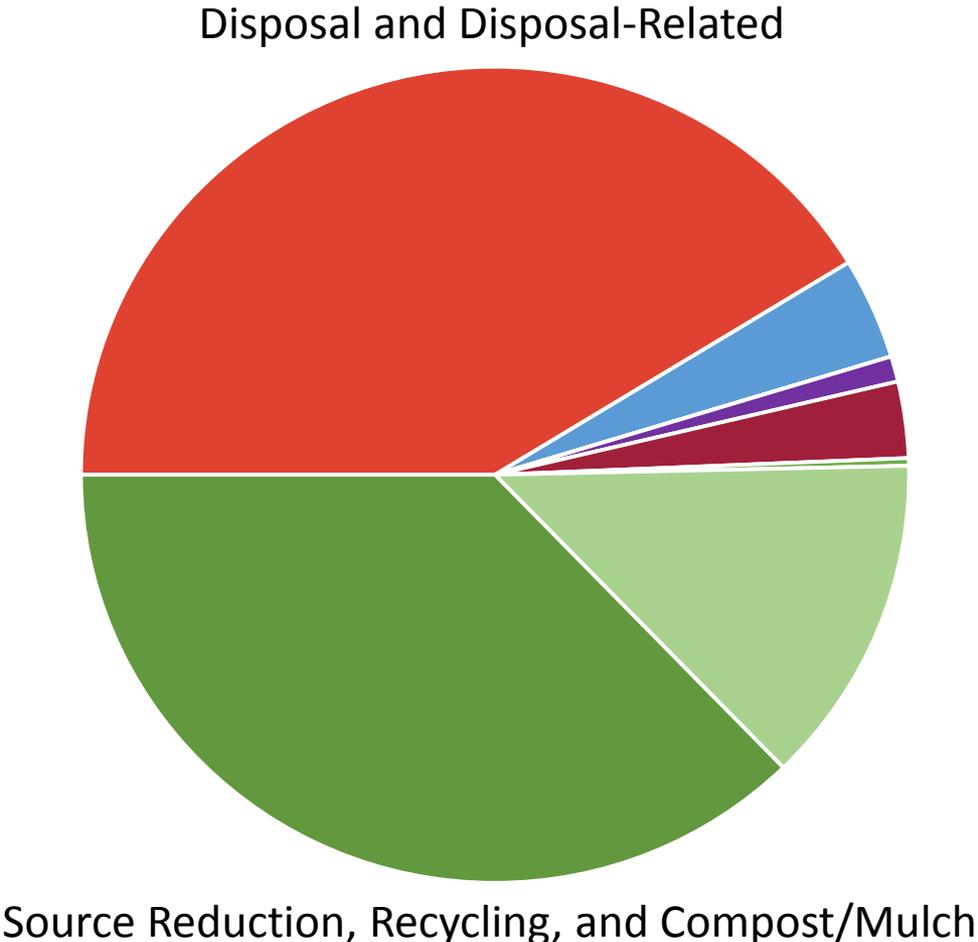
# Most States Use a Solid Waste Fee

## State Solid Waste Program Funding





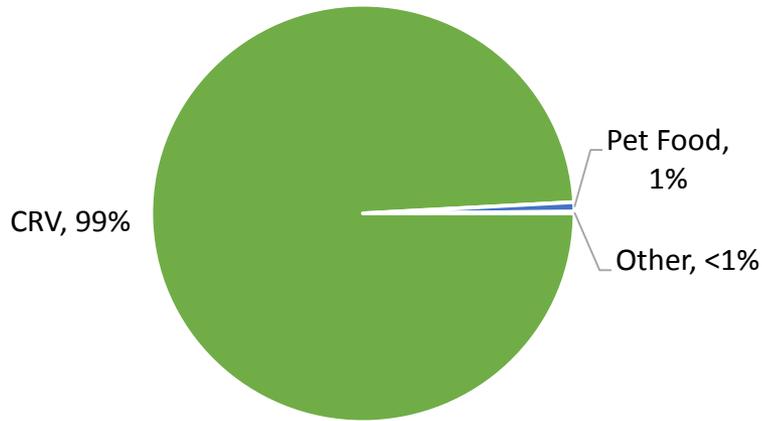
# Recycling Infrastructure Questions and Policy Issues



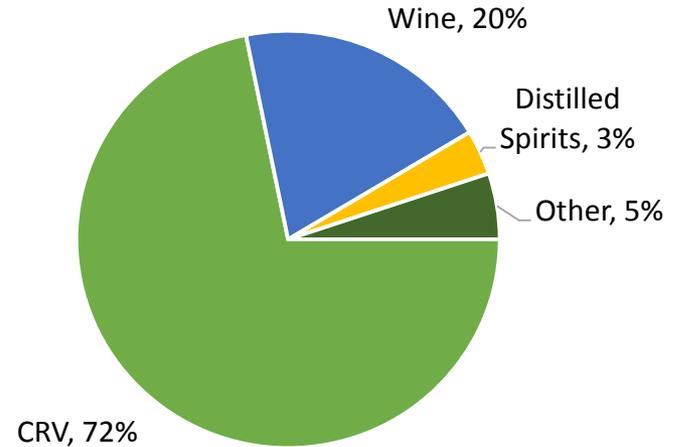
What materials are recycled in California?

# Materials Returned through BCRP

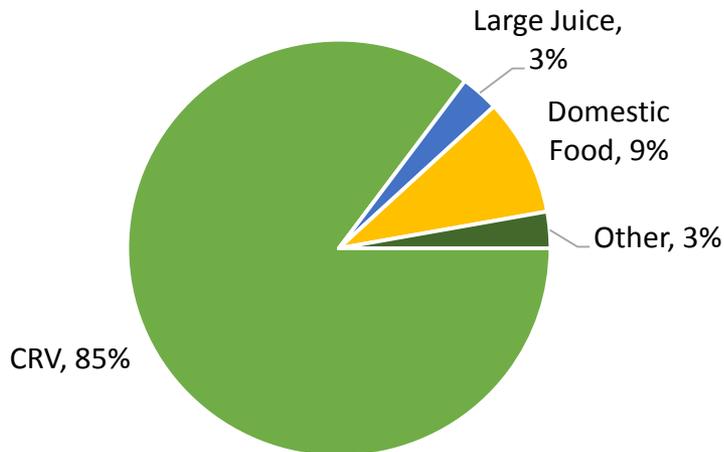
## Aluminum



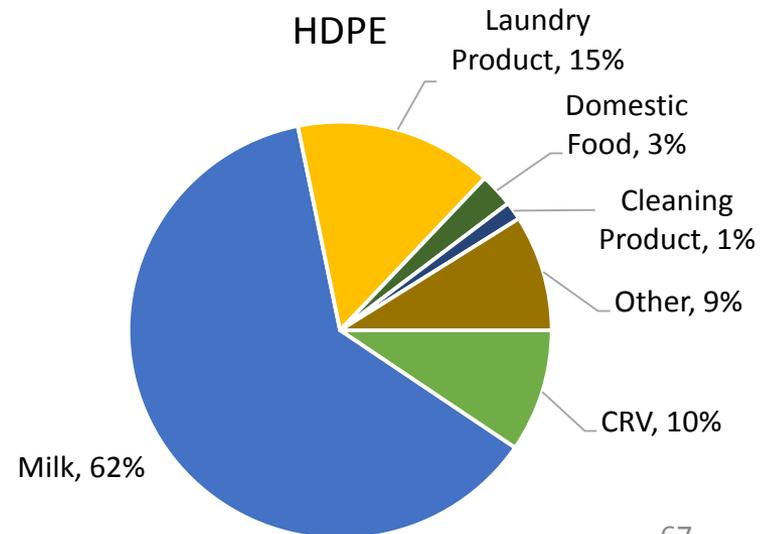
## Glass



## PET

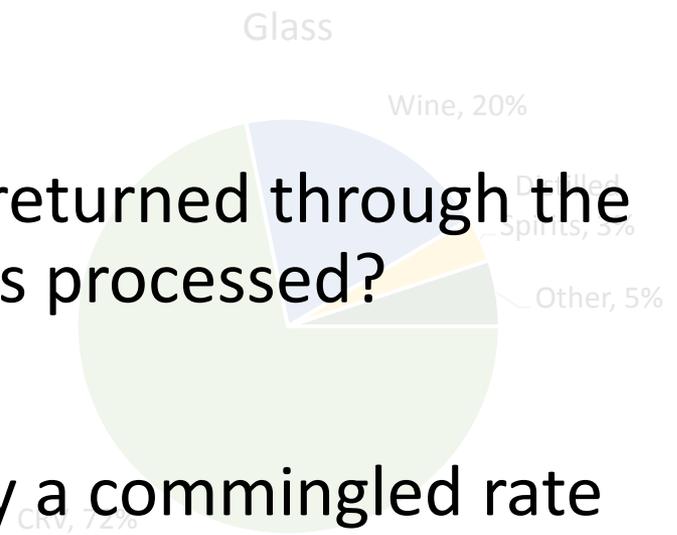
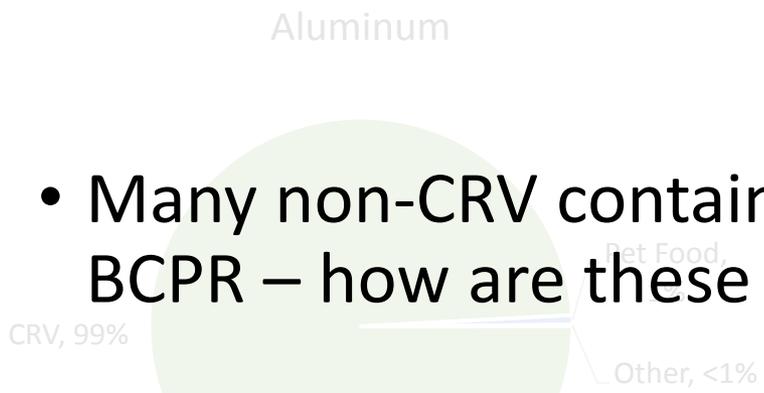


## HDPE

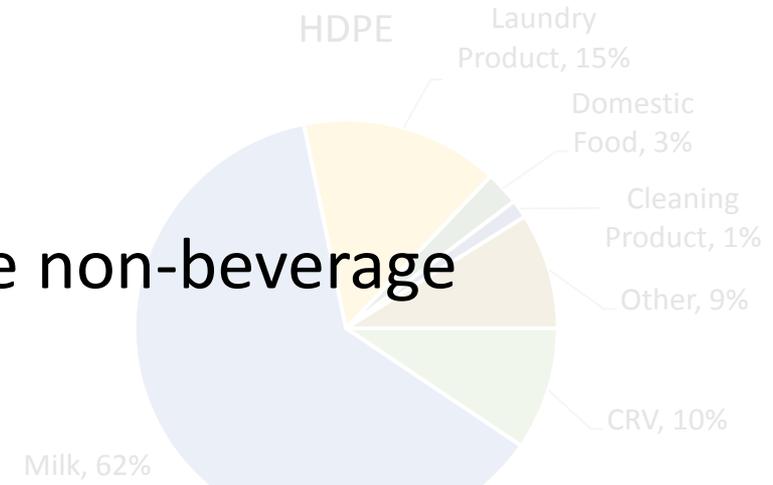
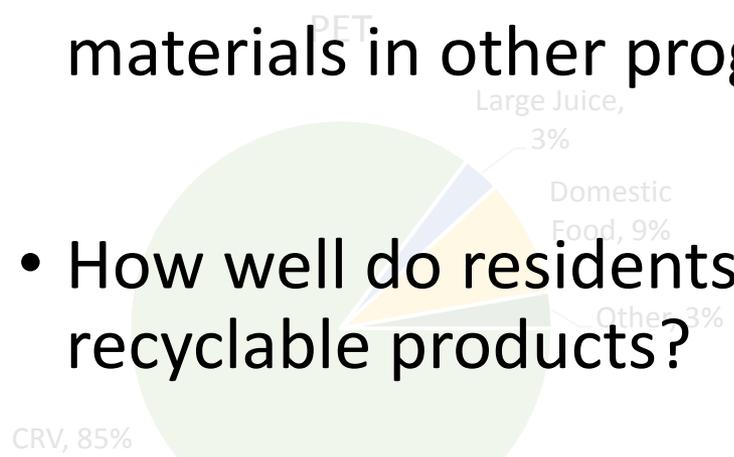


# Materials Returned through BCRP

- Many non-CRV containers are returned through the BCRP – how are these materials processed?



- Recycling centers no longer pay a commingled rate – how will this affect the amount of non-CRV materials in other programs?



- How well do residents handle non-beverage recyclable products?

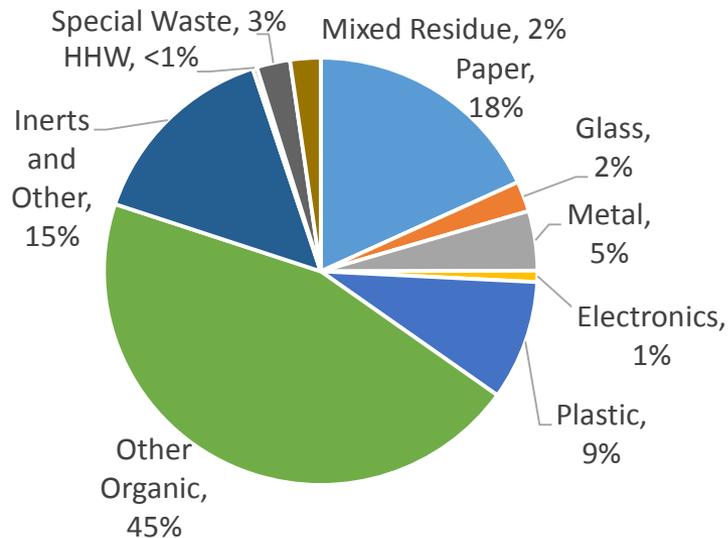
What are the impacts of mandatory commercial and commercial organic recycling?

# Mandatory Commercial Recycling

- Requires businesses to arrange for recycling services (July 1, 2012)
- Allows for mixed waste processing that yield diversion rates comparable to source separation
- How effective is MCR?
- What does “comparable to source separation” mean?
- How much additional in-state infrastructure is necessary?

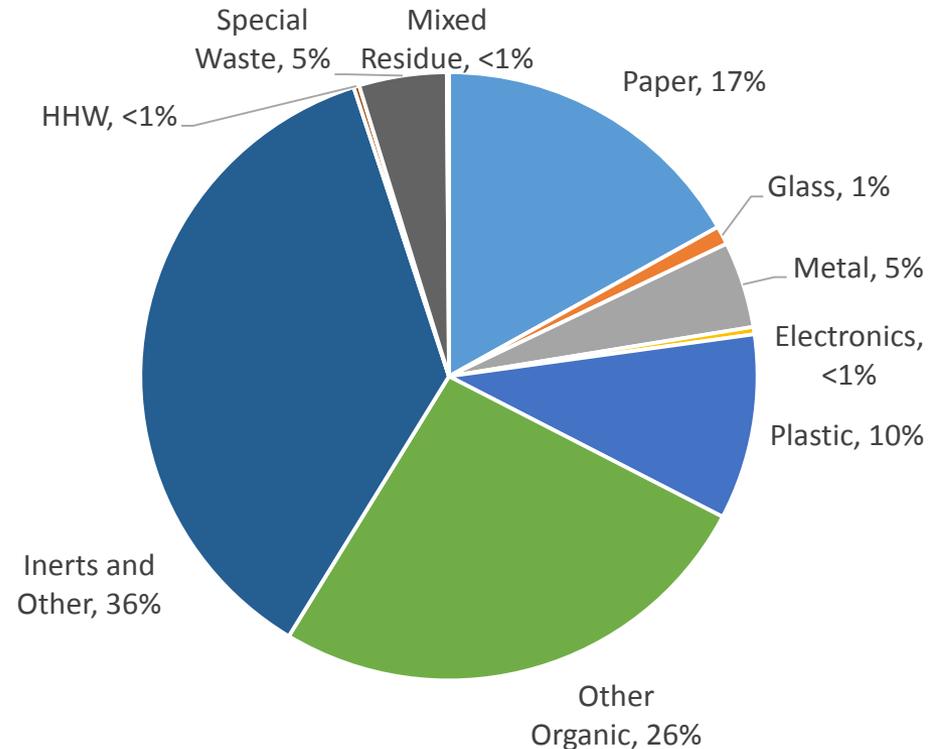
# Mandatory Commercial Organic Recycling

## Residential (33%)



*Organics = 6.0 MT*

## Commercial (67%)

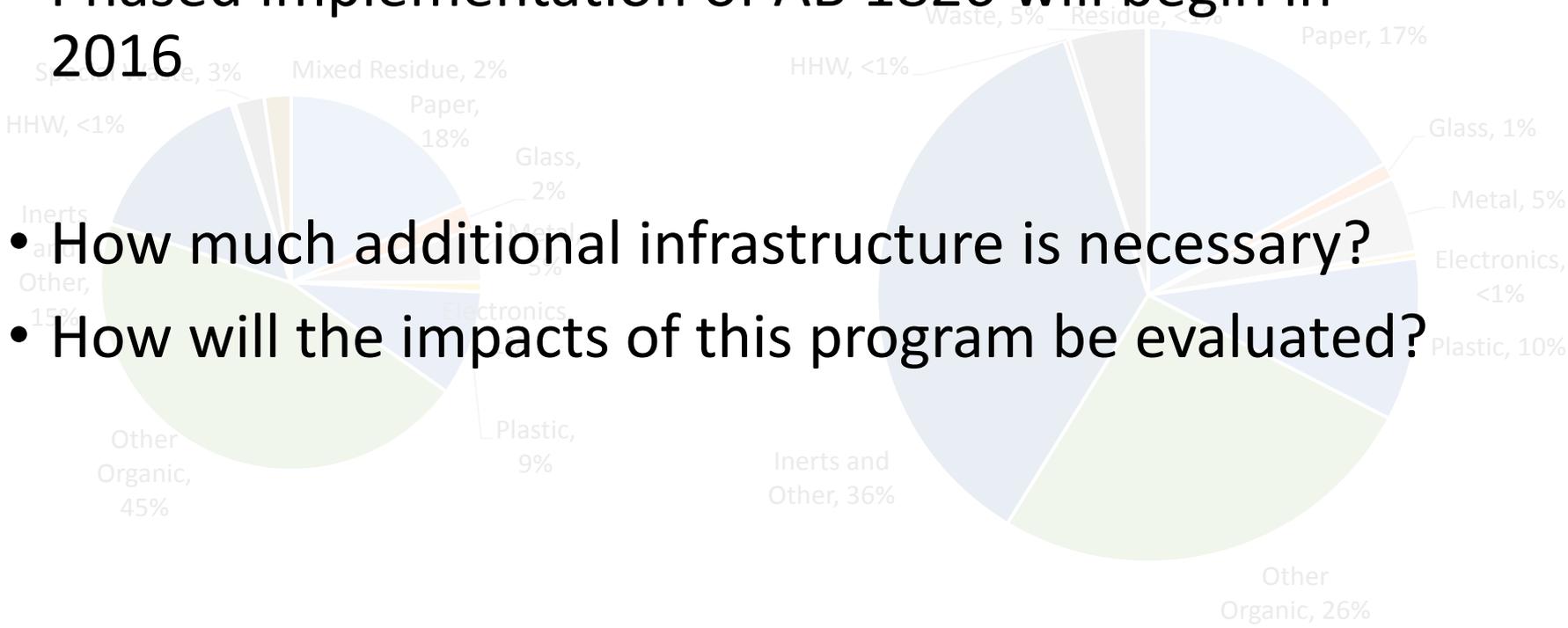


*Organics = 6.9 MT*

# Mandatory Commercial Organic Recycling

- Phased implementation of AB 1826 will begin in 2016

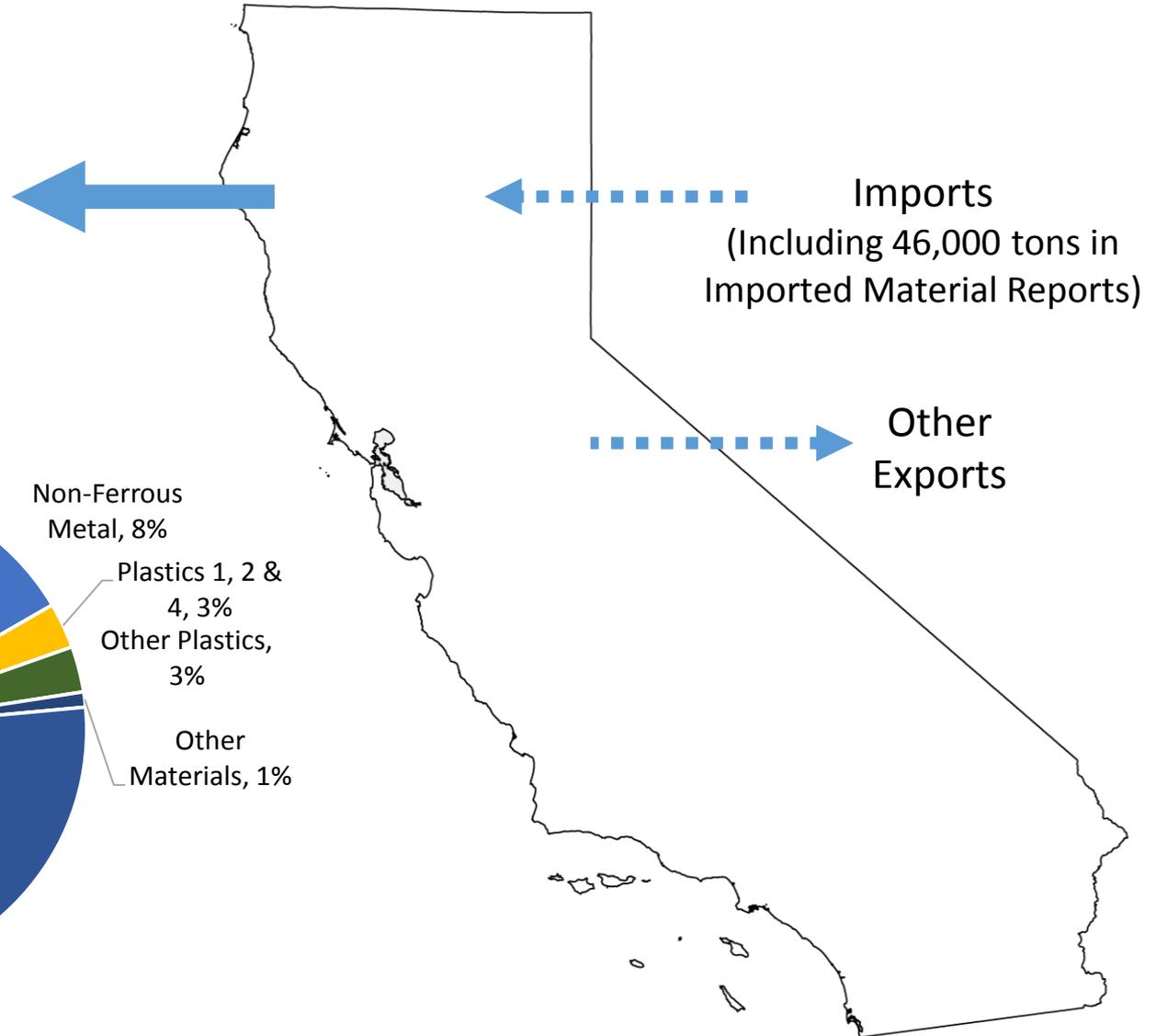
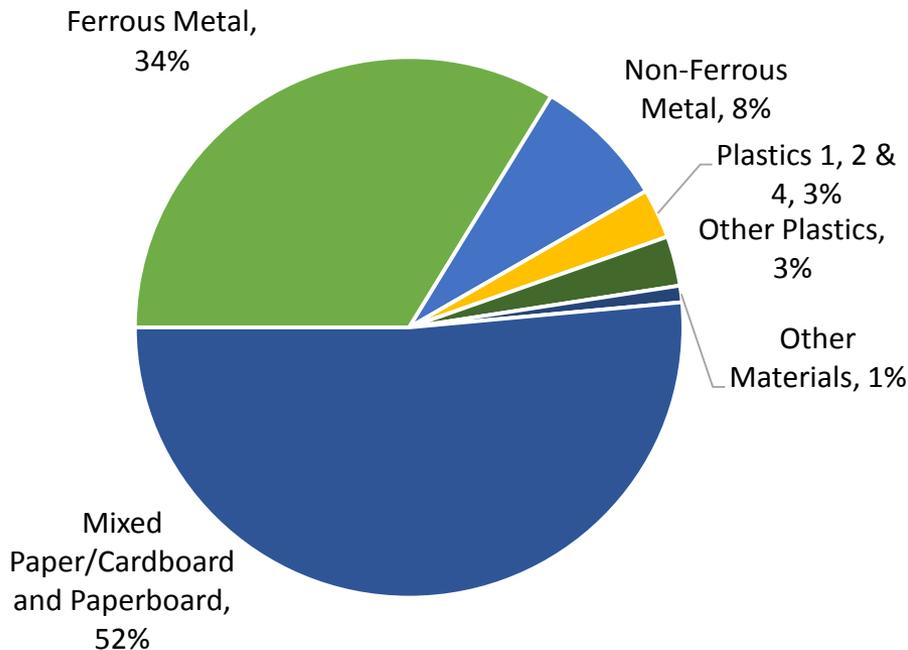
- How much additional infrastructure is necessary?
- How will the impacts of this program be evaluated?



How do imports and exports affect the California recycling infrastructure?

# Importing and Exporting Recyclables

18.6 million tons  
(US exports by sea)  
~70% from California



# Importing and Exporting Recyclables

- How many tons of recyclables are imported into California?

- How much of the exported recyclables originate in California? How much is exported through other means (e.g., train or truck)?

- How are exported recyclables handled at their destination?

Mixed Paper/Cardboard and Paperboard, 52%

Ferrous Metals, 34%

Non-Ferrous Metals, 12%

Plastics 1, 2 & 3, 4, 10%

Other Plastics, 3%

Other, 1%

How much additional infrastructure is  
required to reach  
75% statewide recycling?

How will California know when it  
reaches 75%?

# Infrastructure Capacity to Reach 75%

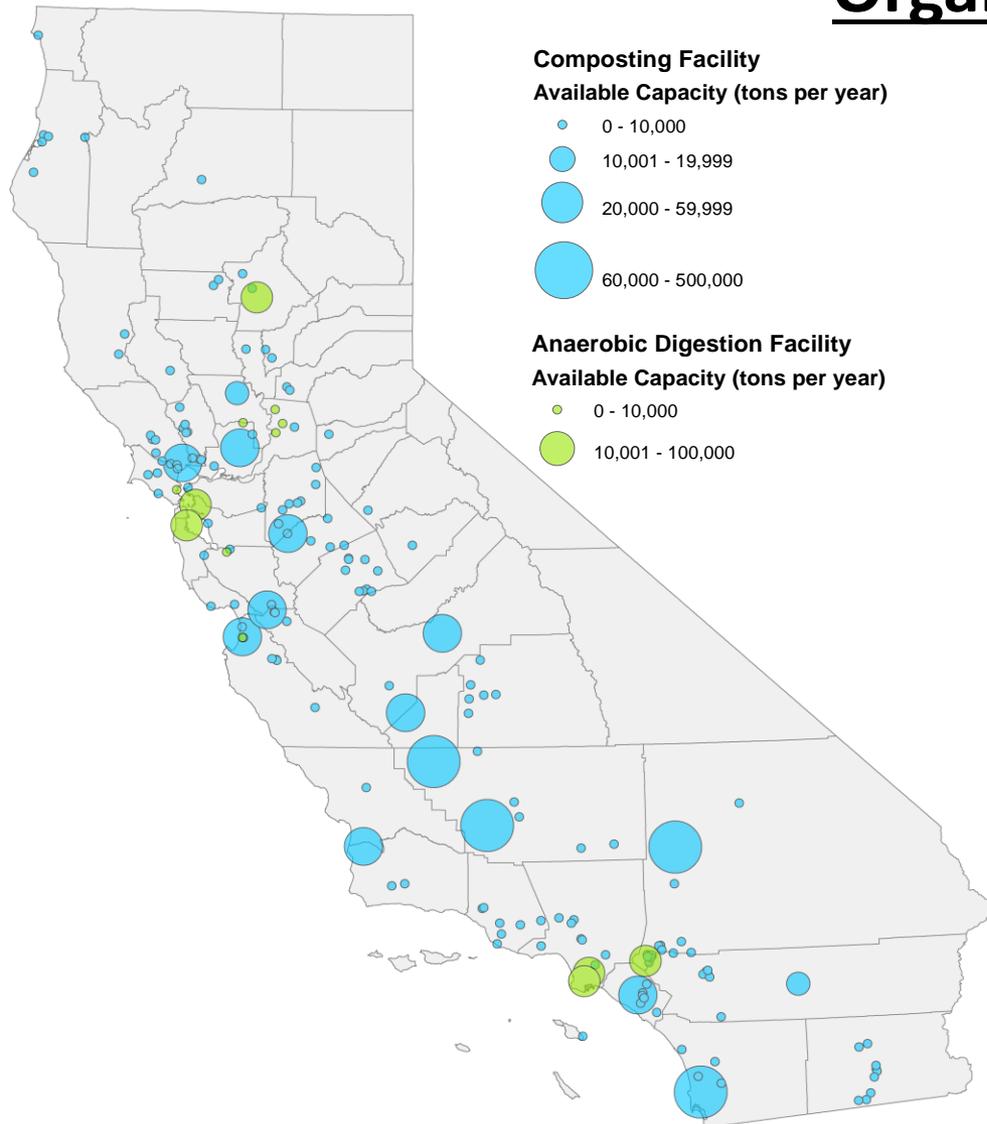
## Plastic, Glass, Paper, and Metal

Material	CRV Collected (Tons)	Processed or Manufactured in CA (Tons)	Manufacturing Annual Capacity (Tons)
Plastic	233,564	54,332	68,000
Glass	683,051	152,247	1,100,000
Metal	142,865	N/A	N/A
Paper	–	–	220,000

- Manufacturing infrastructure insufficient to keep all recyclable materials in California

# Infrastructure Capacity to Reach 75%

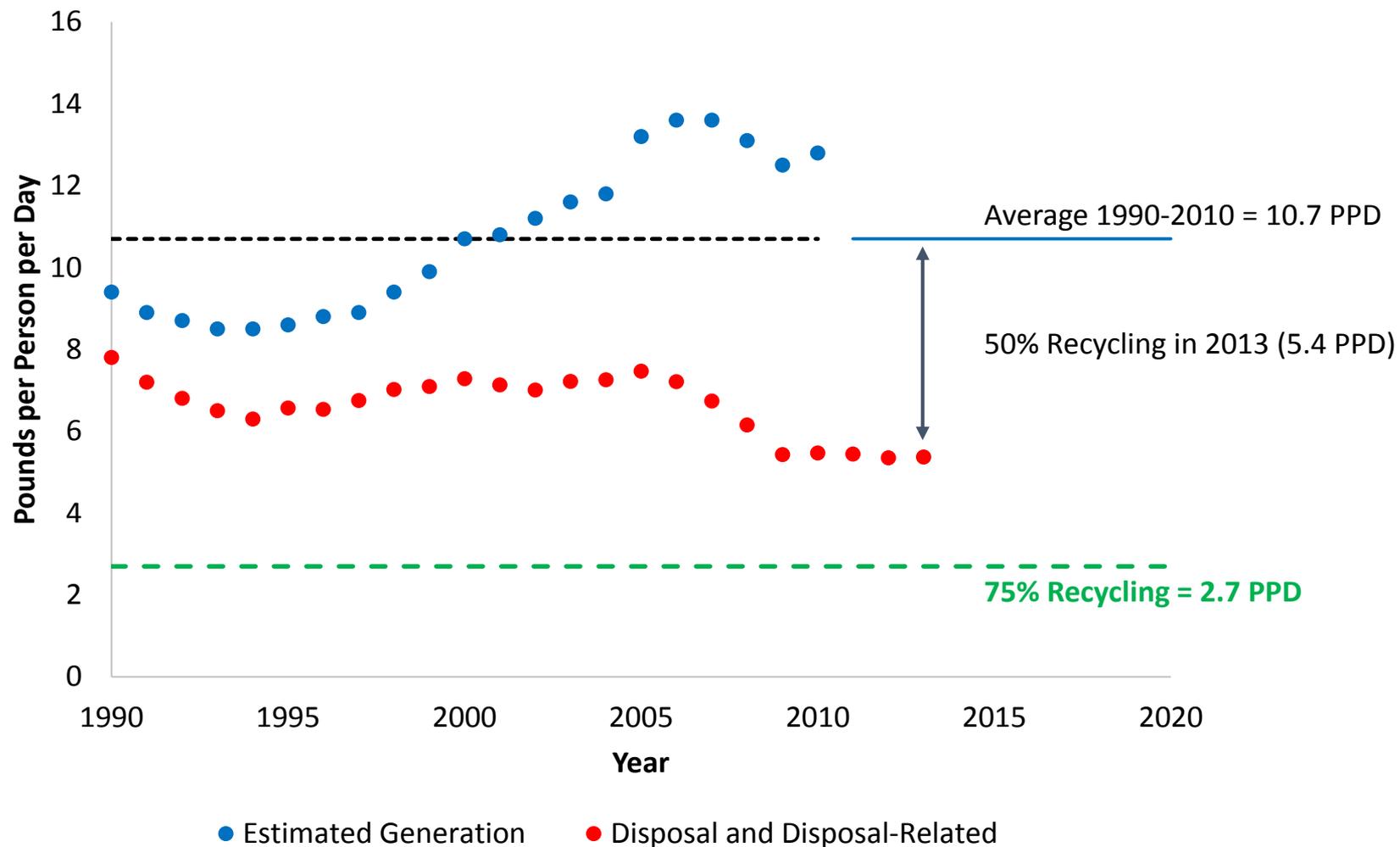
## Organics



- Currently ~1.5 million tons of additional available capacity for organics

- How much would the infrastructure need to grow in order to support California's recycling initiatives?

# How will we know when we reach 75%?



How will California fund its efforts toward the 75% recycling goal?

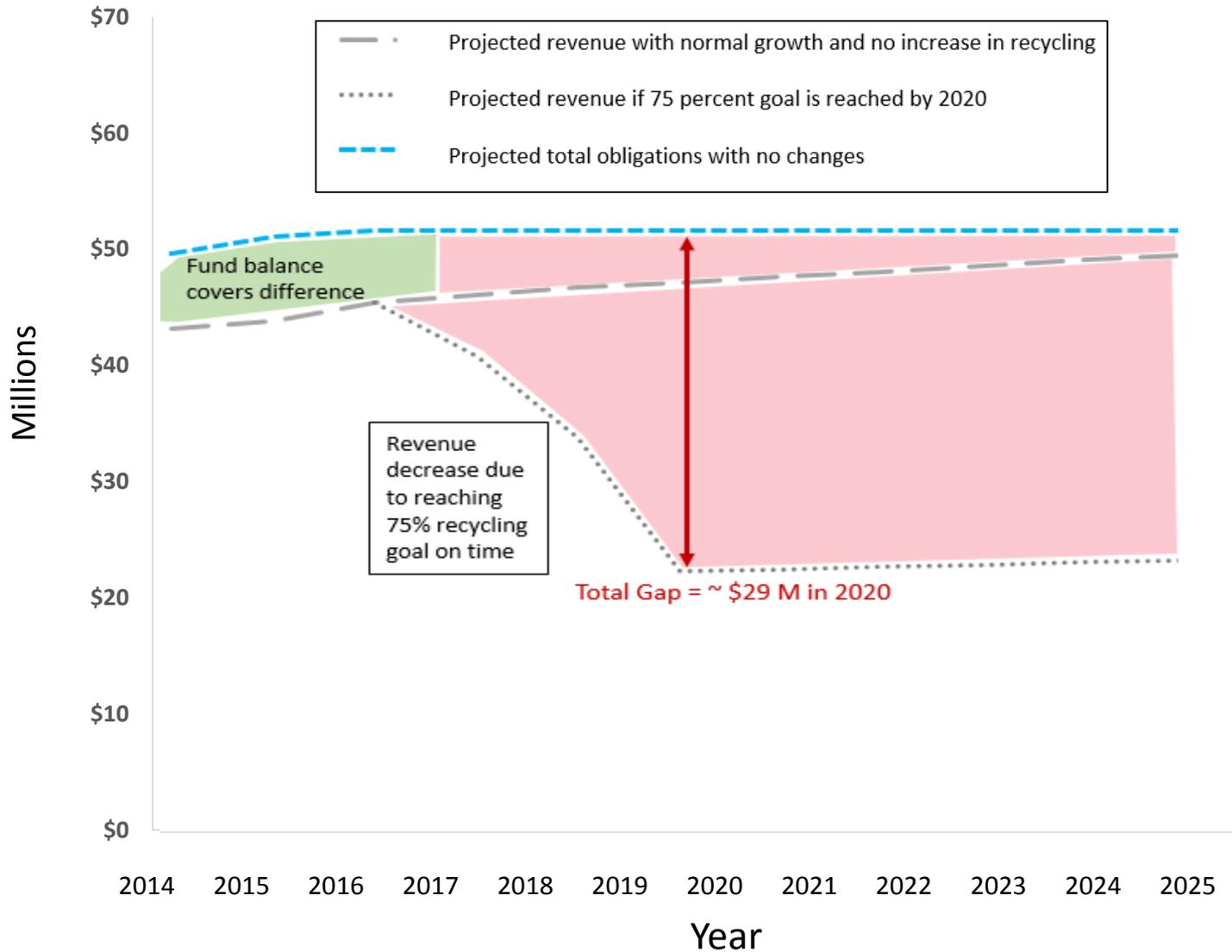
# Sources of Revenue in California

## Fiscal Year 2012/2013

Fund	2012/2013 Revenue
Integrated Waste Management Account	\$40,910,000
California Tire Recycling Management Fund	\$51,967,000
California Used Oil Recycling Fund	\$28,763,000
Electronic Waste Recovery and Recycling Account	\$86,884,000
California Beverage Container Recycling Fund	\$1,162,265,000
Recycling Processing Fees (Glass, Bimetal, and PET)	\$13,208,000
<b>Total</b>	<b>\$1,383,997,000</b>

Current revenue sources include EPR programs.

# CalRecycle Funding Scenario if 75% Statewide Recycling Goal Met in 2020



# Funding Needs for 75% Recycling

CalRecycle will require an estimated **\$165 - \$295** million/year in additional resources to achieve and maintain the 75% goal

- Reduction in revenue from 75% goal (~ **\$29 million/year**)
- Increases in CalRecycle staffing to support the development and regulation of new facilities (~ **\$11 million/year**)
- Infrastructure and market development (~ **\$125 - 255 million/year**)
- *Note: Potential additional costs for landfill closure and post-closure care are not included in the above estimates*



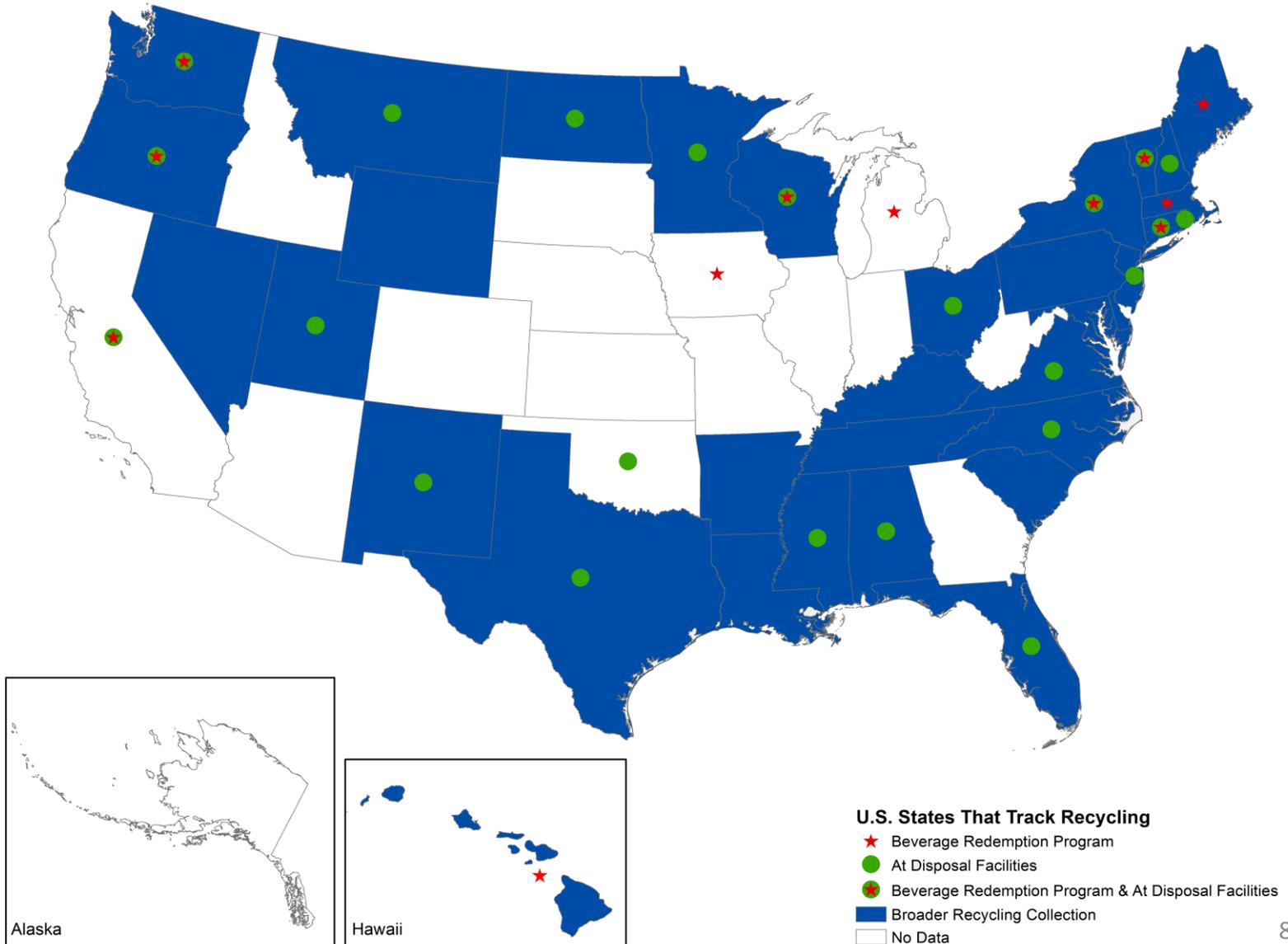
# Funding Structure under 75% Recycling

## How will CalRecycle:

- Provide resources to achieve and maintain 75% goal?
- Account for funding shortfall resulting from achieving 75% goal?
- Financially discourage disposal of organics and other recyclables?
- Ensure that disposal-related activities are not exempt from fees?
- Diversify funding sources to reduce reliance on disposal fees?

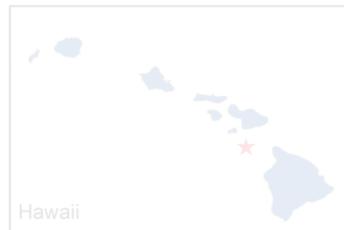
How does California  
compare to other states?

# Comparison to Other States



# Comparison to Other States

- How do other states track recyclables?
- What policies are in place in other states or countries that facilitate the recycling infrastructure?
- Are there lessons that California can learn from?



## U.S. States That Track Recycling

- ★ Beverage Redemption Program
- At Disposal Facilities
- Beverage Redemption Program & At Disposal Facilities
- Broader Recycling Collection
- No Data

# Summary of Reports

Infrastructure  
and Tracking

Materials  
Flows

Infrastructure  
Capacity

Waste  
Characterization

Funding

Comparisons to  
Other States

# Questions and Discussion