YOLO COUNTY GOVERNMENT

An Action Plan For Reducing GHG From County Operations

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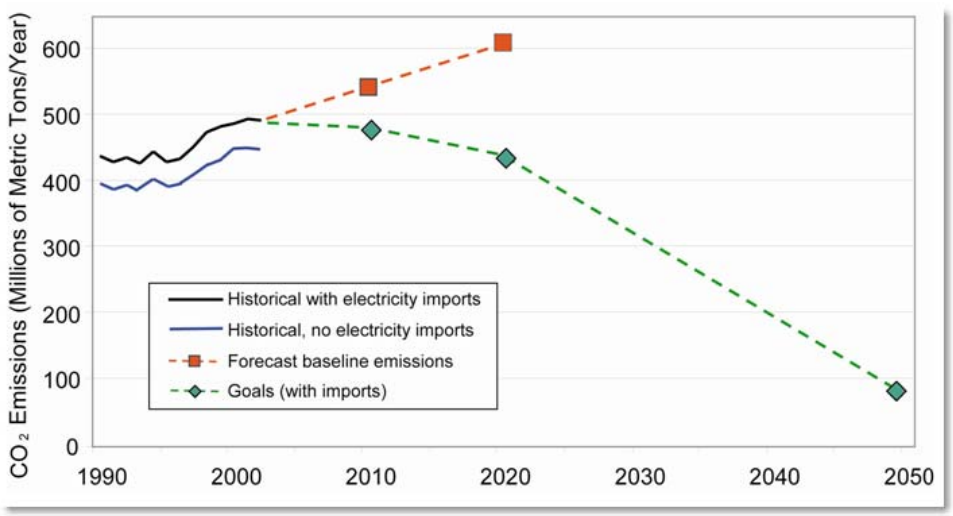
A Public Service Project

Study Backdrop



Source: Bemis and Allen, 2005

- **AB32**
  - Set GHG emissions target: 1990 by 2020
- **S-20-06**
  - 80% of 1990 by 2050
- **Local level**
  - 100 CA mayors (rep. 40% of the pop) committed to reductions 1990 by 2012
- **Cool Climate Declaration**
  - 10% every 5yrs, starting 2010
  - Yolo County: Resolution 07-109

Objectives

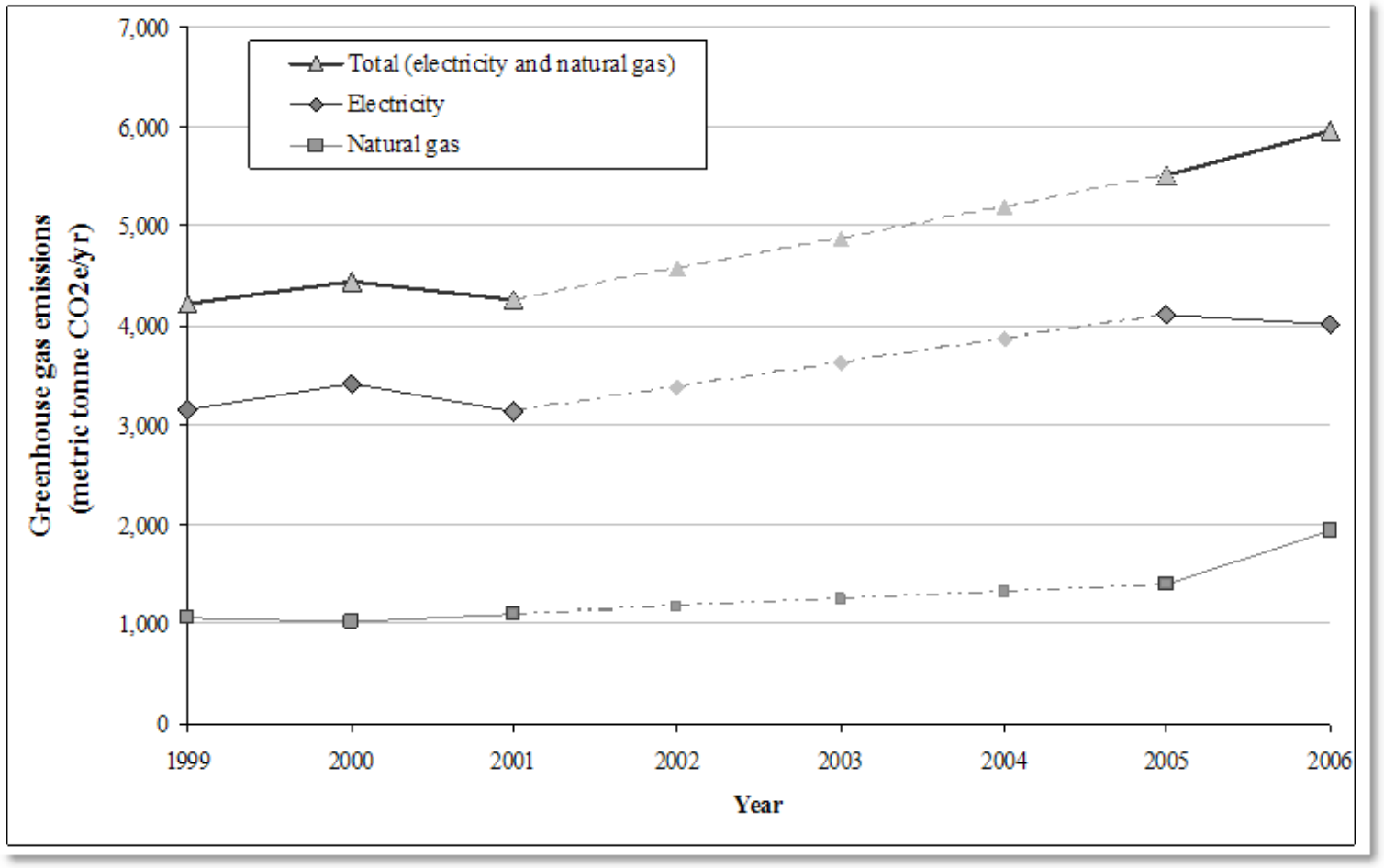
- **Holistically assessment of current GHG emissions for Yolo county governmental operations**
  - Buildings (3 case studies: Admin, DESS, Davis Library)
  - Mobile Sources (vehicle fleet)
- **Recommend improvements in the county's operations and technology stock to mitigate those emissions**
  - Near-term (07-10): off-the-shelf technology; basic practices
  - Mid-Term (2010-15): emerging; training, education
  - Long-term (2015-20): large-scale replacements

Baseline Emissions

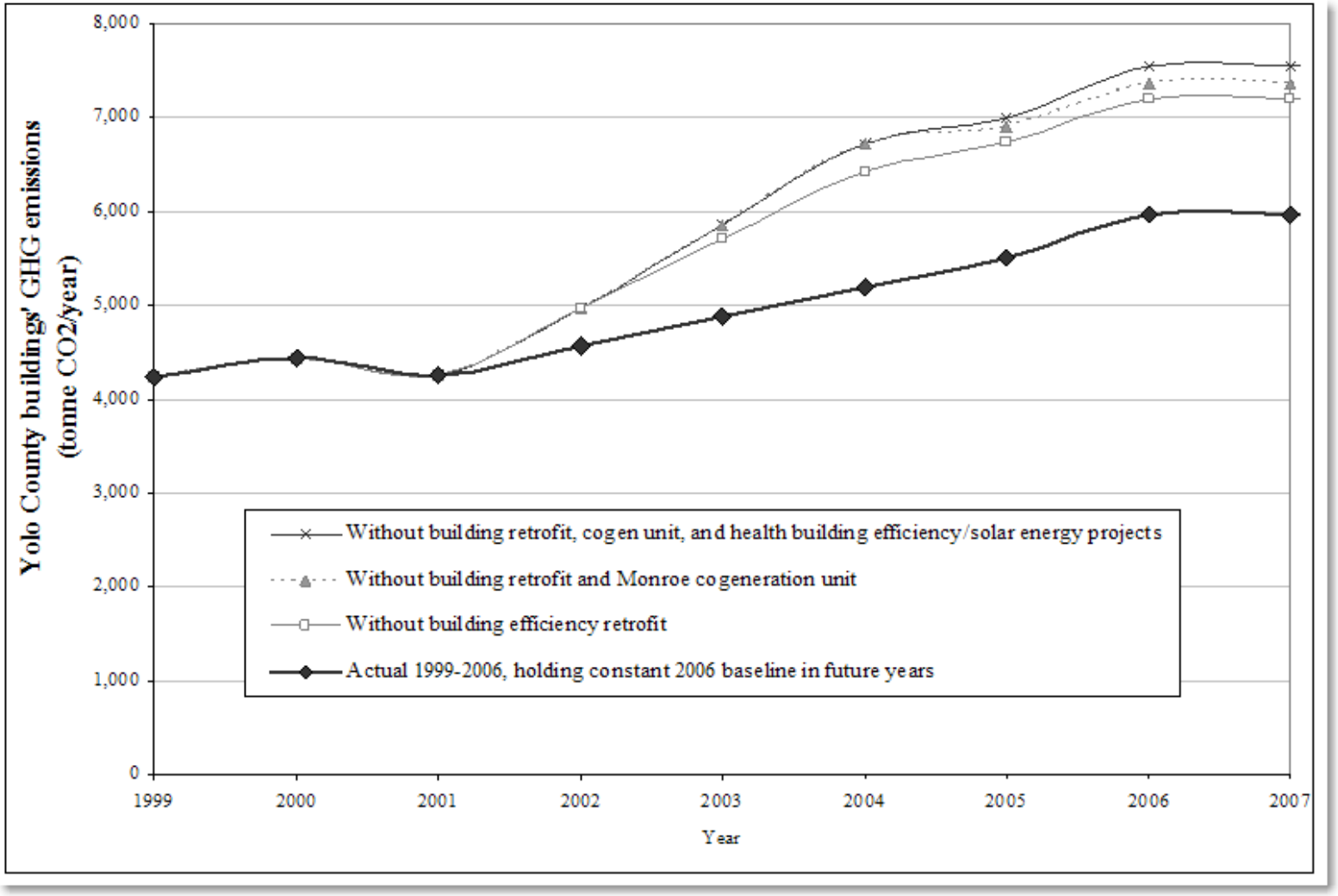
- **Climate Action Registry**

Category	Type	Use (energy source)	GHG emissions (tonne CO_2) by fuel				Percent
			Electricity	Natural gas	Diesel	Gasoline	
Indirect	Stationary	Buildings (electricity)	4,018	-	-	-	49%
Direct		Buildings (natural gas)	-	1,379	-	-	17%
		Buildings (co-generation)	-	563	-	-	7%
		Portable power	-	-	176	19	2%
	Mobile	Vehicles	-	-	133	1,894	25%
Percent			49%	24%	4%	23%	

Building emissions over time



Prior Improvements



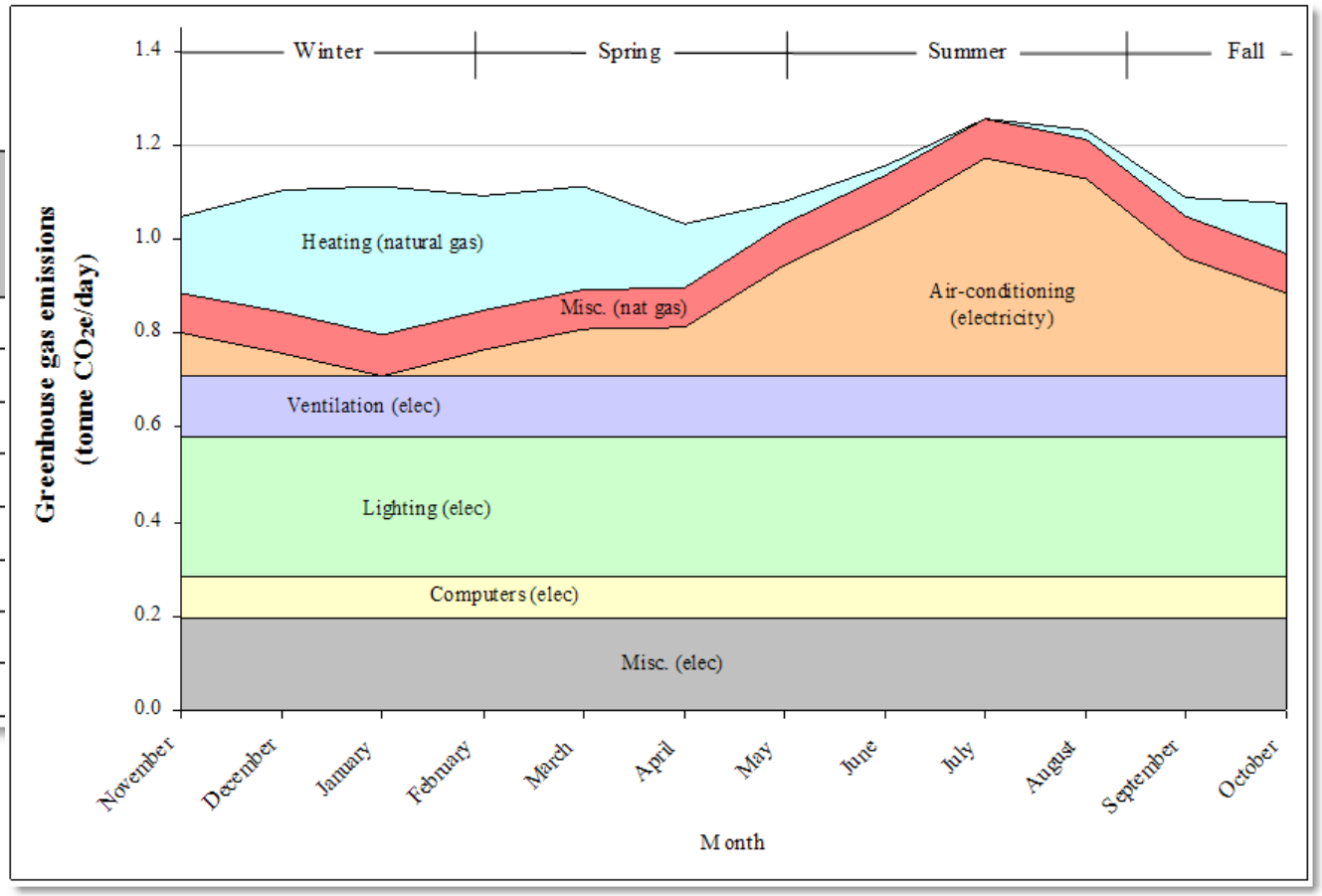
Building Emissions

- **Appliances and Ofc Equip**

Measure	Description	Initial cost [a] ($/unit)	Payback period [b] (yr)	Data source(s)
Computer efficiency	ENERGY STAR-certified computer procurement (many available brands); offers approximately 20% reduction in electricity use compared with conventional	$0	<1	US EPA and US DOE 2007; LBNL 2006
Computer and monitor power management	Networked computer software for IT department (network administrator) control of computer and monitor power management (e.g., EZ GPO, EZ Save, EZConserve); offers 50-90% reduction use, depending on current power management practice.	$0-$15	<1	US EPA and US DOE 2007; Degans 2003; LBNL 2002; Sachs et al, 2004
Refrigerator efficiency	ENERGY STAR-certified refrigerator procurement; 15% reduction in electricity use from federal standards; 40% lower electricity use than conventional 2001 models	$30-$70	4	Sunpower 2003, LGE 2003, Unger 1999, Vineyard and Sand 1997; US DOE 2004
Refrigerator excess capacity reduction	Unplugging (or selling) excess refrigerators; Consolidation between departments or groups of workers with nearby under-utilized refrigerators	$0	<1	-
Water cooler efficiency (cold)	ENERGY STAR-certified water coolers (cold water only) 55% more efficient due to improved chilling mechanism	$5	<1	LBNL, 2004
Water cooler efficiency (hot-cold)	ENERGY STAR-certified water coolers (hot-and-cold water type) 62% more efficient with better insulation/separation of hot and cold	$12	4	Nadel et al, 2006; PG&E, 2004a; LBNL, 2004
Printer efficiency (small)	ENERGY STAR-qualified printers use 50% less energy, print double-sided, and run cooler (small, 10 page/min)	$37	2	Industry data 2007; LBNL 2006

Case Studies

End use
Heating (natural gas)
Air-conditioning (electricity)
Ventilation (electricity)
Cogeneration (gas and elec)
Lighting (electricity)
Computers (electricity)
Misc.(electricity)
Misc. (natural gas)



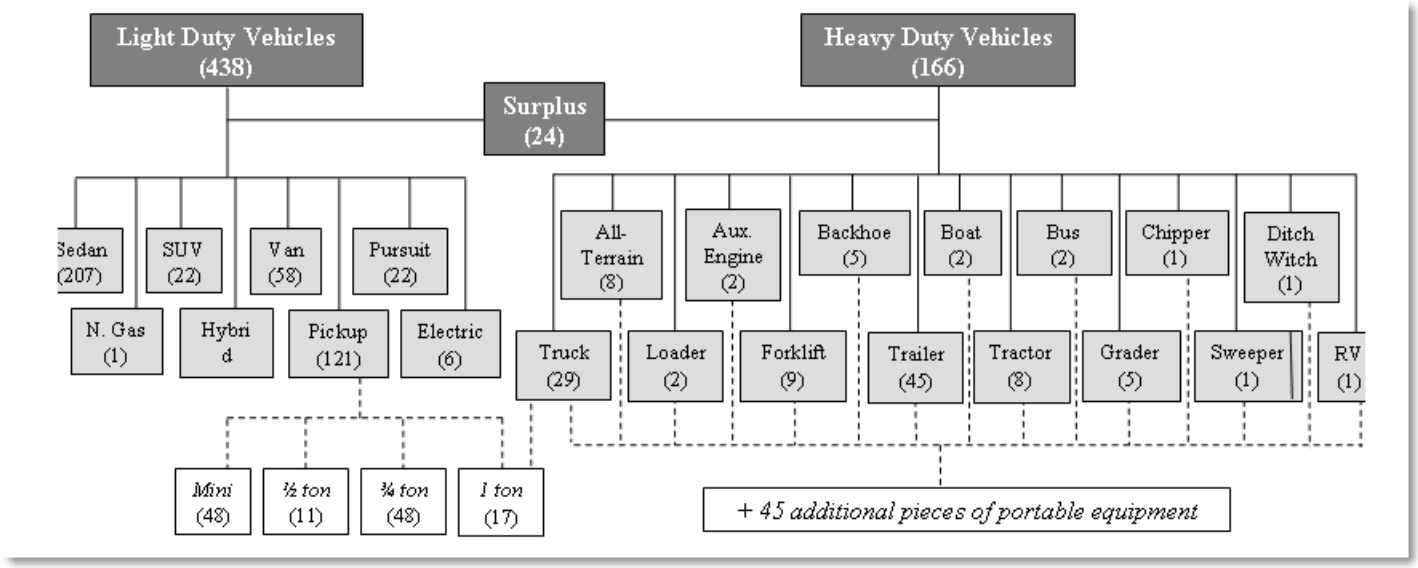
Administration Building
GHGs by End Use

Case Study Recommendations

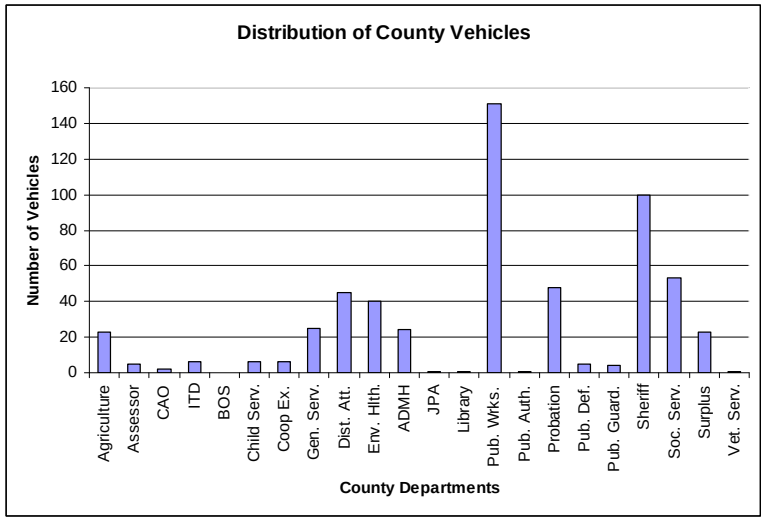
Area	Recommended action	GHG reduction (tonnes CO_2e/yr)
Lighting	Replace EXIT signs with LED technology	1.4
	Replace exterior high-pressure sodium lights with fluorescents	1.7
	Replace wall-mount metal vapor lights with LED	0.7
	Replace ceiling-recessed HID fixtures with fluorescent	2.7
	Install bathroom occupancy sensors	0.4
	Install emergency stairwell occupancy sensors	1.2
	Utilize natural daylighting in 3500 square feet (5%) of building	3.3
HVAC	Seasonal temperature settings adjustment during working hours (65 F in winter, 75 F in summer) and during non-working hours (57 F in winter, 83 F in summer)	20.7
	Sealing off unused building spaces (10% of building)	8.2
	Ventilation inspection, repair	17.2
Appliance	Water heater insulation jackets	6.6
Building shell	Installation of triple-paned windows throughout the building	13.0
Total, all measures (as percent of total building GHG emissions)		77.0 (19%)

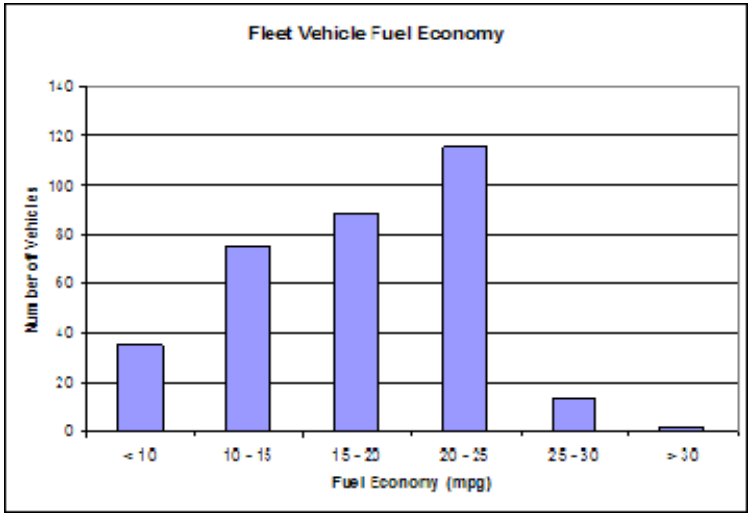
Administration Building

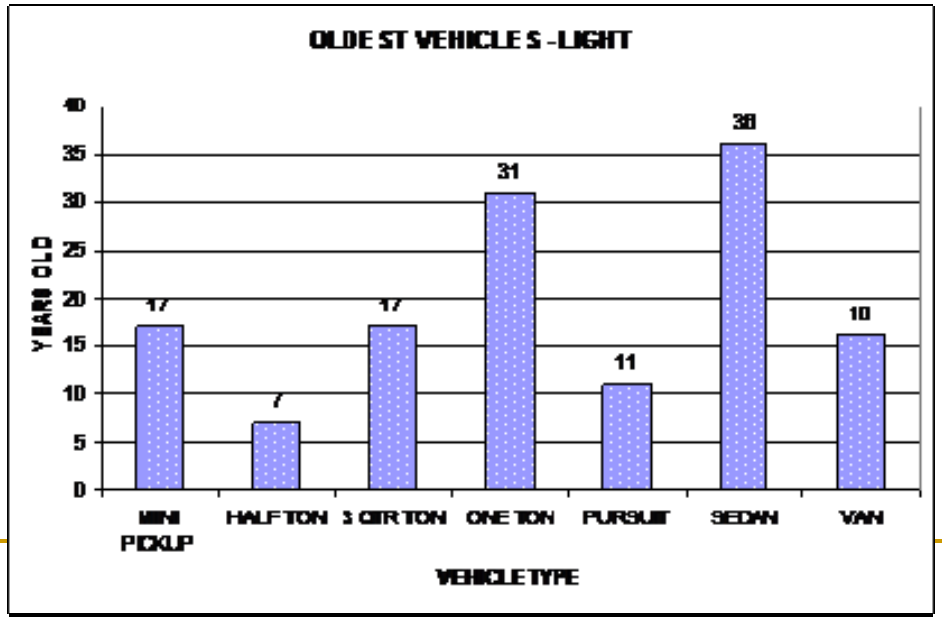
Vehicle Fleet Modifications



Gen Fleet Characteristics







Primary Recommendations

- **Fleet consolidation**
- **Vehicle check-out procedure**
- **Best practices for O&M**
- **New database for recording fleet information**
  - Mileage
  - Fuel
  - Maintenance
- **Revisit vehicle purchasing guidelines**

No GHG Growth Policy?

- **Potential growth in GHGs**
  - Expansions for population growth over time
- **GHG reductions in existing buildings *stabilize* – they don't offset expansion**
  - Different building designs
  - Offset strategies