

Reducing Air Pollution and Greenhouse Gas Emissions in the Transportation Sector

ICLEI Tools and Resources for Local Governments

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ICLEI - Local Governments for Sustainability

*Carbon Neutral Fleets Presentation
Responsible Purchasing Network
August 21st, 2007*

Presentation Outline

- What is ICLEI – Local Governments for Sustainability
- Climate Change and Transportation
- ICLEI Emissions Analysis Software
- Examples of Municipal Climate Leaders

ICLEI – Local Governments for Sustainability

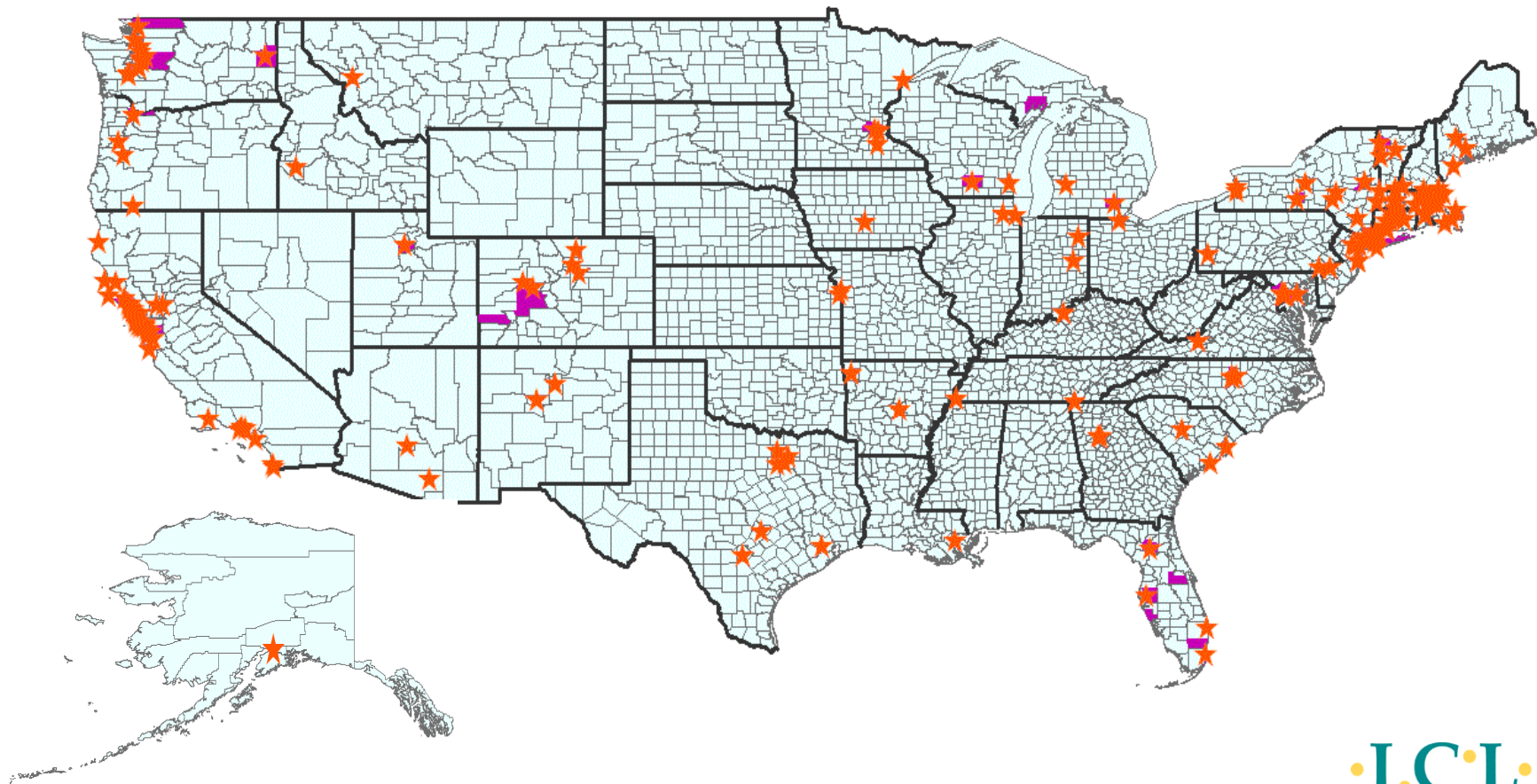
A worldwide movement of local governments dedicated to achieving tangible improvements in global environmental conditions through cumulative local action



ICLEI USA Programs:

- **Climate Mitigation**
- **Climate Adaptation / Resilience**
- **Sustainability Performance**

ICLEI Participants



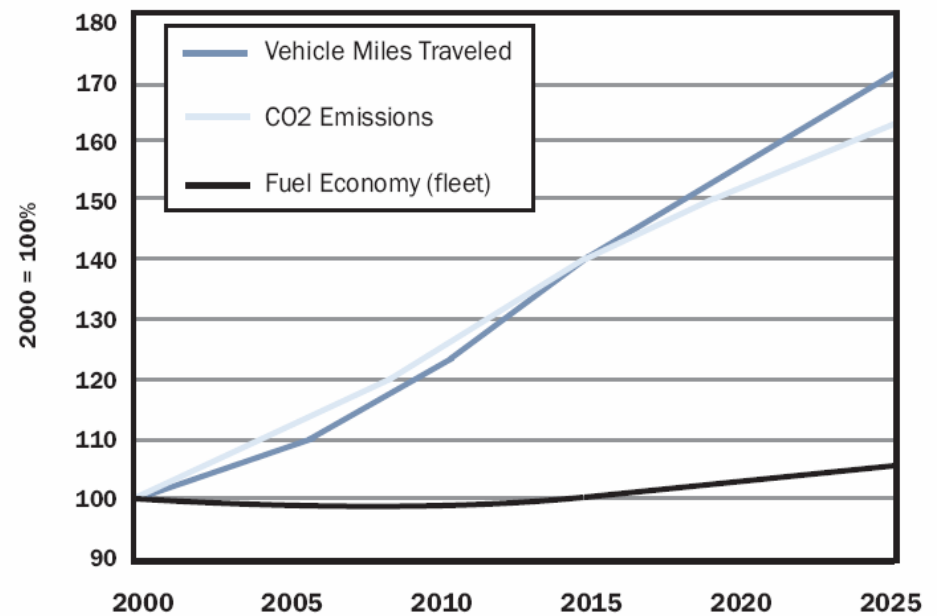
The ICLEI 5-Milestone Process



GHG Emissions from Transportation

- Transportation accounts for nearly 1/3 of *GHG* emissions in the U.S.
- From 1990 to 2004, transportation emissions in U.S. increased 29%
- Recent increases in emissions attributed to greater Vehicle Miles Traveled (VMT)
- Long-term growth in driving distances and reduced fuel efficiencies are expected to outpace the emissions benefits of vehicle technology improvements

Figure 1: Growth in Travel Outstripping Vehicle Efficiency Improvements



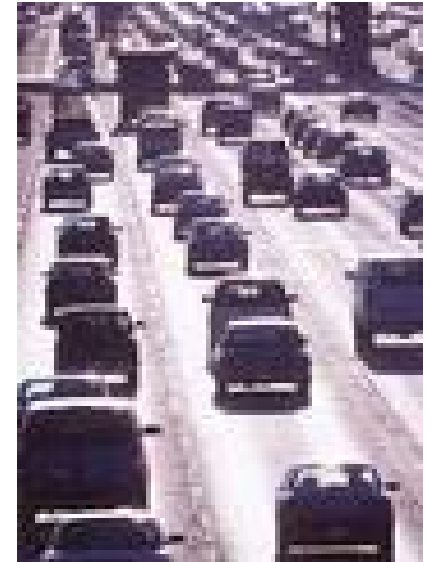
Center for Clean Air Policy

Source: US DOE, EIA "AEO 2004"

There's room for improvement

Good News: Reducing Emissions from Transportation can lead to huge benefits

- Create a legacy of leadership
- Reduce municipal operating costs
- Improve air quality
- Protect public health
- Address traffic and other transport woes
- Develop local economy and employment
- Improve sustainability and livability of the community



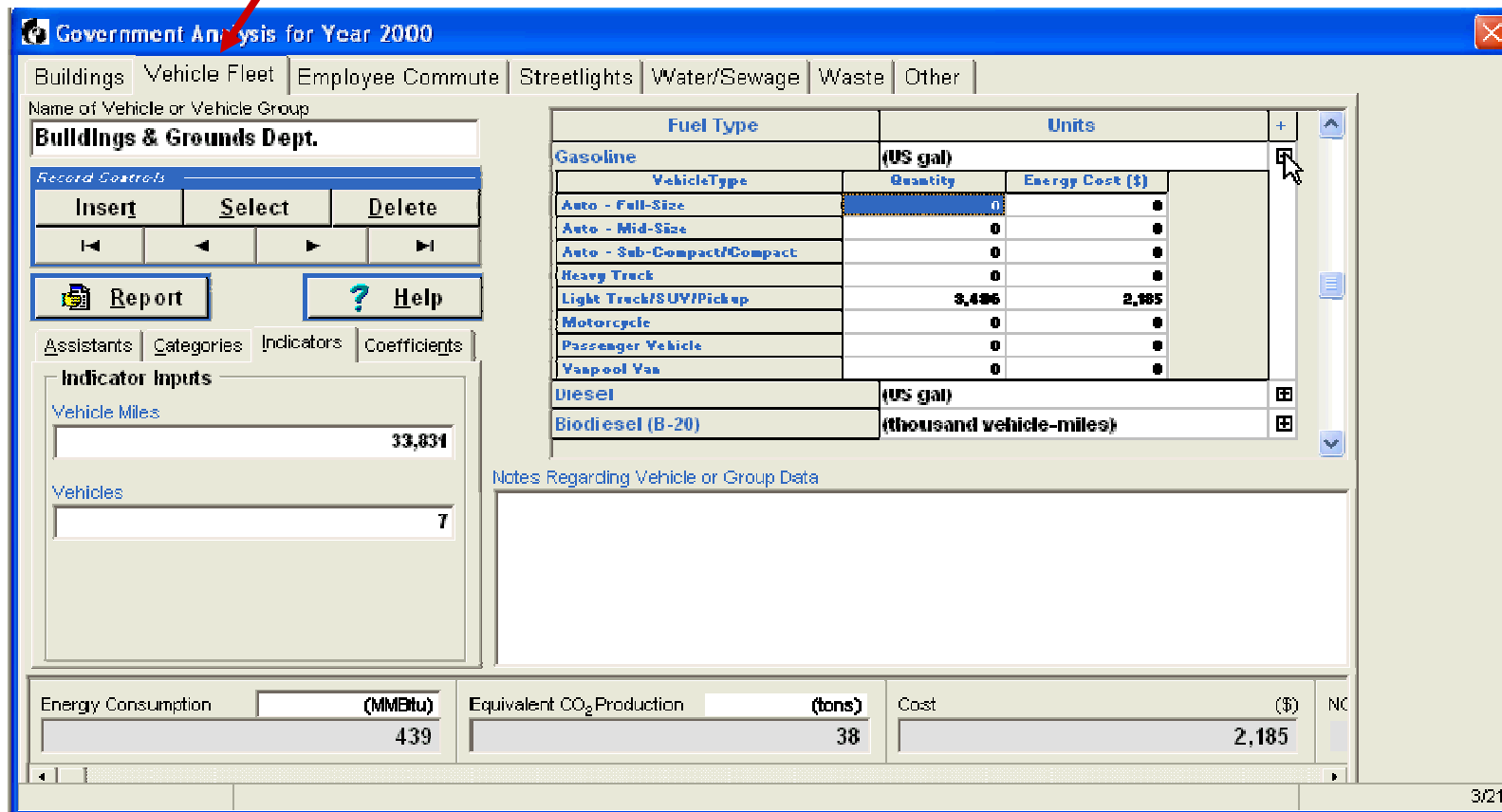
Here's How ICLEI Can HELP

Clean Air and Climate Protection (CACCP) Software

- Big picture policy and planning assistance tool for state and local governments
- Tool for storing, organizing, analyzing data to:
 - Develop emissions inventories
 - Evaluate proposed measures/scenarios
 - Develop or evaluate policy and local action plans
- Multi-pollutant emissions coverage:

eCO₂, NO_x, SO_x, CO, VOCs, PM₁₀

Vehicle Fleet is one of Several Sectors Tracked in an Emissions Inventory Using CACPS



Government Analysis for Year 2000

Buildings | **Vehicle Fleet** | Employee Commute | Streetlights | Water/Sewage | Waste | Other

Name of Vehicle or Vehicle Group: **Buildings & Grounds Dept.**

Record Controls

Insert | Select | Delete

Report | Help

Assistants | Categories | Indicators | Coefficients

Indicator Inputs

Vehicle Miles: 33,831

Vehicles: 7

Fuel Type	Units
Gasoline	(US gal)
Auto - Full-Size	0
Auto - Mid-Size	0
Auto - Sub-Compact/Compact	0
Heavy Truck	0
Light Truck/SUV/Pickup	3,496
Motorcycle	0
Passenger Vehicle	0
Vaspool Van	0
Diesel	(US gal)
Biodiesel (B-20)	(thousand vehicle-miles)

Energy Cost (\$): 2,185

Notes Regarding Vehicle or Group Data

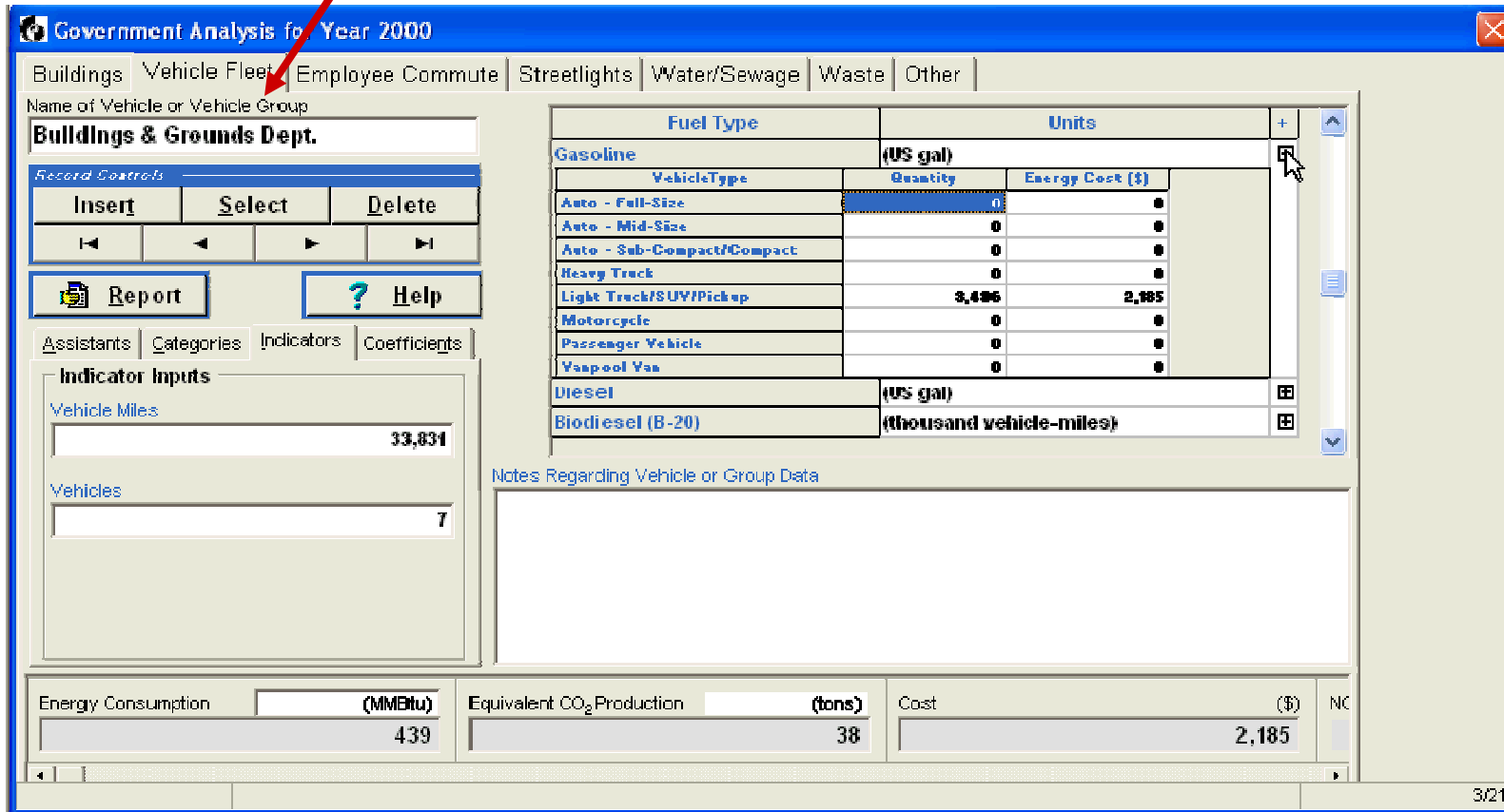
Energy Consumption (MMBtu): 439

Equivalent CO₂ Production (tons): 38

Cost (\$): 2,185

3/21

Vehicles are tracked individually or in clusters



Government Analysis for Year 2000

Buildings | **Vehicle Fleet** | Employee Commute | Streetlights | Water/Sewage | Waste | Other

Name of Vehicle or Vehicle Group
Buildings & Grounds Dept.

Record Controls
Insert | Select | Delete
◀ | ▶

Report | **Help**

Assistants | Categories | Indicators | Coefficients

Indicator Inputs
Vehicle Miles: 33,831
Vehicles: 7

Fuel Type	Units	Quantity	Energy Cost (\$)
Gasoline	(US gal)		
Auto - Full-Size		0	0
Auto - Mid-Size		0	0
Auto - Sub-Compact/Compact		0	0
Heavy Truck		0	0
Light Truck/SUV/Pickup		3,496	2,185
Motorcycle		0	0
Passenger Vehicle		0	0
Vaspool Van		0	0
Diesel	(US gal)		
Biodiesel (B-20)	(thousand vehicle-miles)		

Notes Regarding Vehicle or Group Data

Energy Consumption: 439 (MMBtu) | Equivalent CO₂ Production: 38 (tons) | Cost: 2,185 (\$)

3/21

GHG and other pollution sources are estimated based on the quantity and type of fuel used by each class of vehicles.

Government Analysis for Year 2000

Buildings | **Vehicle Fleet** | Employee Commute | Streetlights | Water/Sewage | Waste | Other

Name of Vehicle or Vehicle Group
Buildings & Grounds Dept.

Record Controls
Insert | Select | Delete
Report | Help

Assistants | Categories | Indicators | Coefficients

Indicator Inputs
Vehicle Miles: 33,831
Vehicles: 7

Fuel Type	Units
Gasoline	(US gal)
VehicleType	Quantity
Auto - Full-Size	0
Auto - Mid-Size	0
Auto - Sub-Compact/Compact	0
Heavy Truck	0
Light Truck/SUV/Pickup	3,496
Motorcycle	0
Passenger Vehicle	0
Vaspool Van	0
Diesel	(US gal)
Biodiesel (B-20)	(thousand vehicle-miles)

Notes Regarding Vehicle or Group Data

Energy Consumption (MMBtu): 439
Equivalent CO₂ Production (tons): 38
Cost (\$): 2,185

3/21

Where data on fuel consumed is unavailable, CACP can help estimate use based on vehicle use and average fuel efficiency by class.

Government Analysis for Year 2000

Buildings | **Vehicle Fleet** | Employee Commute | Streetlights | Water/Sewage | Waste | Other

Name of Vehicle or Vehicle Group
Buildings & Grounds Dept.

Record Controls

Insert	Select	Delete
◀	◀	▶

Report **Help**

Assistants | Categories | **Indicators** | Coefficients

Indicator Inputs

Vehicle Miles:

Vehicles:

Fuel Type	Units
Gasoline	(US gal)
Vehicle Type	Quantity
Auto - Full-Size	0
Auto - Mid-Size	0
Auto - Sub-Compact/Compact	0
Recap Truck	0
Light Truck/SUV/Pickup	3,186
Motorcycle	0
Passenger Vehicle	0
Yankee Van	0
Diesel	(US gal)
Biodiesel (B-20)	(thousand vehicle-miles)

Notes Regarding Vehicle or Group Data

Energy Consumption	(MMBtu)	439
Equivalent CO ₂ Production	(tons)	38
Cost	(\$)	2,185

3/21

CACP also helps track fuel cost.

Government Analysis for Year 2000

Buildings | **Vehicle Fleet** | Employee Commute | Streetlights | Water/Sewage | Waste | Other

Name of Vehicle or Vehicle Group
Buildings & Grounds Dept.

Record Controls

Insert	Select	Delete
◀	◀	▶

Report Help

Assistants | Categories | **Indicators** | Coefficients

Indicator Inputs

Vehicle Miles
33,831

Vehicles
7

Fuel Type	Units
Gasoline	(US gal)
VehicleType	Quantity Energy Cost (\$)
Auto - Full-Size	0 0
Auto - Mid-Size	0 0
Auto - Sub-Compact/Compact	0 0
Heavy Truck	0 0
Light Truck/SUV/Pickup	3,496 2,185
Motorcycle	0 0
Passenger Vehicle	0 0
Vanpool Van	0 0
Diesel	(US gal)
Biodiesel (B-20)	(thousand vehicle-miles)

Notes Regarding Vehicle or Group Data

Energy Consumption (MMBtu) 439 Equivalent CO₂ Production (tons) 38 Cost (\$) 2,185 NC

3/21

Model Outputs are energy used, CO₂e, total cost and the criteria air pollutants: NO_x, SO_x, CO, VOC's and PM₁₀.

Government Analysis for Year 2000

Buildings | **Vehicle Fleet** | Employee Commute | Streetlights | Water/Sewage | Waste | Other

Name of Vehicle or Vehicle Group: **Buildings & Grounds Dept.**

Record Controls

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◀	◀	▶

Report **Help**

Assistants | Categories | Indicators | Coefficients

Indicator Inputs

Vehicle Miles:

Vehicles:

Fuel Type	Units
Gasoline	(US gal)
VehicleType	Quantity
Auto - Full-Size	0
Auto - Mid-Size	0
Auto - Sub-Compact/Compact	0
Heavy Truck	0
Light Truck/SUV/Pickup	3,496
Motorcycle	0
Passenger Vehicle	0
Yam-pool Van	0
Diesel	(US gal)
Biodiesel (B-20)	(thousand vehicle-miles)

Notes Regarding Vehicle or Group Data

Energy Consumption (MMBtu) Equivalent CO₂ Production (tons) Cost (\$)

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CACP's Measures analysis allows comparison of scenarios to determine the benefits of specific actions

Government Measures [Target Year 2010]

Buildings | Vehicle Fleet | Employee Commute | Streetlights | Water/Sewage | Waste | Other

Measure Type: **Change in Fuel Type**

Measure Name:

Measure Description, Notes and Assumptions: [Expand](#)

Initial Fuel and Vehicle Type | Replacement Fuel and Vehicle Type

Before Measure

- ☒ Ethanol-Diesel
- ☐ Gasoline
 - Auto - Full-Size
 - Auto - Mid-Size
 - Auto - Sub-Compact/Compact
 - Heavy Truck
 - Light Truck/SUV/Pickup
 - Motorcycle
 - Passenger Vehicle
 - Vanpool Van

Use Before: (vehicle-miles)

(\$ per vehicle-mile)

Transport Specific

Fuel Efficiency: (miles/US gal)

Occupancy Factor:

Location:

Location of Measure (type in or use list):

Energy Reduction: (MMBtu)

Equivalent CO₂ Reduction: (tons)

Savings: (\$)

CACP's Measures analysis allows comparison of scenarios to determine the benefits of specific actions

Government Measures [Target Year 2010]

Buildings | **Vehicle Fleet** | Employee Commute | Streetlights | Water/Sewage | Waste | Other

Measure Type: **Change in Fuel Type**

Measure Name:

Measure Description, Notes and Assumptions: [Expand](#)

Initial Fuel and Vehicle Type | **Replacement Fuel and Vehicle Type**

After Measure

- Auto - Mid-Size
- LEV
- SULEV
- Tier1
- TLEV
- ULEV
- + Auto - Sub-Compact/Compact
- + Heavy Truck - Large
- + Heavy Truck - Medium
- + Heavy Truck - Small

Use After (vehicle-miles): 50,000.0 (\$ per vehicle-mile)

Transport Specific

Fuel Efficiency | Occupancy Factor | (miles/US gal gasoline eq): 27.2

Location | Implementation Data | Coefficients

Location of Measure (type in or use list): your town

Energy Reduction	(MMBtu)	Equivalent CO ₂ Reduction	(tons)	Savings	(\$)	N
	128	11		0		

Mobile Source Emissions Factors

■ National Average Set

- 10 basic vehicle classes, common fuels and alternative fuels (like BD, Ethanol, CNG, etc.)
- Year dependent
- National emission inventory and DOT data
- Appropriate for basic inventory estimate



■ Fuel Standards Set

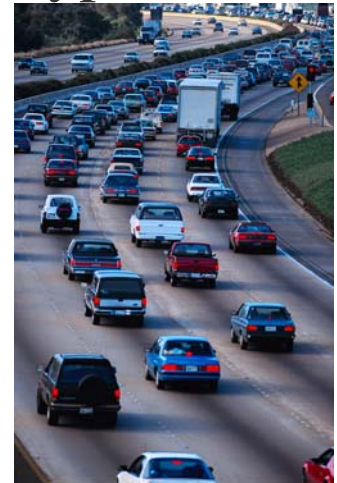
- Emission factors by vehicle type and emission standard
- Appropriate for quantifying measures

Benefits of CACP Inventory for Fleet Managers

- Places fleet emissions in the context of all government and community emissions
- Scaleable, has been used by communities with only a few dozen vehicles to New York City
- Places emissions and cost savings data side-by-side
- Allows governments and communities to move towards carbon neutrality

Benefits of CACP Measures Analysis for Fleet Managers

- Allows comparison of relative benefits of numerous types of measures:
 - VMT Reductions
 - Fuel switching (contains 15 types of fuel)
 - Improved vehicle fuel efficiency
 - Increased vehicle occupancy
 - Changes in class of vehicle used
- Allows comparison of known fuel efficiencies, average fuel efficiencies and statutory standards
- Allows monitoring of progress towards carbon neutrality



Techniques employed by ICLEI members to Reduce Transportation Emissions

- Switch to public transit
- Vehicle fuel switching – alt. fueled and electric vehicles
- Vehicle fuel efficiency increase & down sizing of fleets
- Trip-reduction / transportation demand management
- Parking cash-out programs
- Anti-idling policies
- Carpooling / vanpooling programs
- Community car-shares
- Establish satellite offices to reduce commute



Cities in Action:

Examples of Municipal Climate Leaders

- Berkeley, CA – Green Fleet Policy
- Denver, CO – Green Fleets Program
- Los Angeles, CA – Police on Bikes
- Huntington, NY – Parking Incentives and Hybrid Buses
- Boston, MA – Clean Transit

Cities in Action:

Berkeley's Green Fleet

HYBRID FLEET

- Retired 9 vehicles and replaced them with 5 City Carshare Priuses
- Saves an estimated 15 tons of CO₂e annually
- Reduced maintenance costs
- Reduced community GHGs by making the cars available to City Carshare members on evenings and weekends



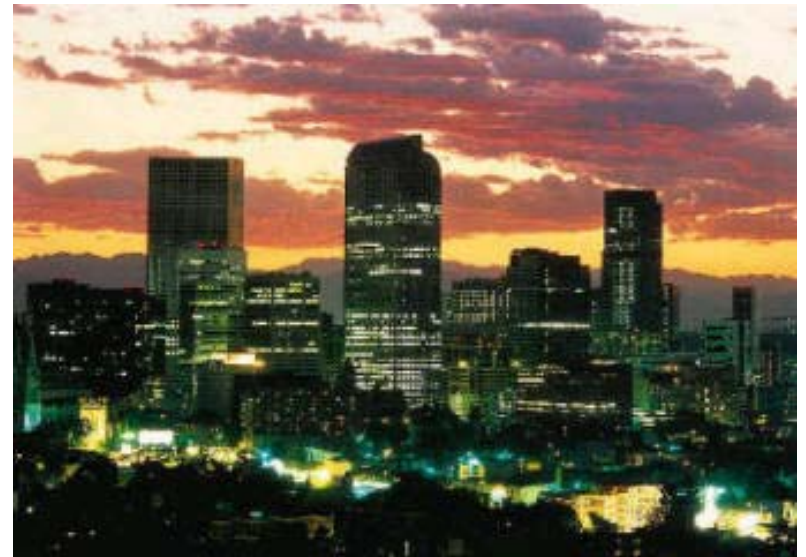
BIODIESEL FLEET

- Converted over 180 vehicles to 100% biodiesel in 2003, emitting 100% less CO₂e per gallon
- Currently using 20% biodiesel, emitting 21% less CO₂e per gallon
- Local criteria air pollutants are significantly reduced

Cities in Action:

Green Fleets Program, Denver, CO

- Replaced city owned vehicles with hybrids and smaller, more fuel efficient vehicles
- 53 sedans were replaced by Toyota Priuses in 2005
- Saves 5,072 gallons of gasoline and 50 tons CO₂e/year.



Cities in Action:

Police on Bikes, Los Angeles, CA



- 15% productivity increase for traffic officers
- Improves morale and community relations
- 15 bikes for traffic officers will save \$350,000 in vehicle costs over 5 years

Cities in Action: Parking Incentives & Hybrid Buses, Huntington, NY

- Recently passed a new ordinance offering free parking passes to all residents driving hybrids or alternative fuel vehicles
- Worked with local manufacturer to provide 3 hybrid buses for the Town



Cities in Action:

Clean Transportation & Air Quality, Boston

- City's 450 diesel vehicles on ULSD
- City purchases 650,000 gallons of bio-diesel
- 500 school buses retrofitted with pollution control technologies
- Green Cabs policy – currently 23 hybrid cabs in City



Local Action Moves the World!

Thank You!



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