

## Cool Cities 2012 Progress Report



## Carbon Footprint 2011 Background

- Cool Cities Committee formed in 2007
  - Focus on City Operations Only
  - Carbon Footprint Baseline (2001-06)
- Goal to reduce carbon footprint (excluding utilities) 15% by 2014

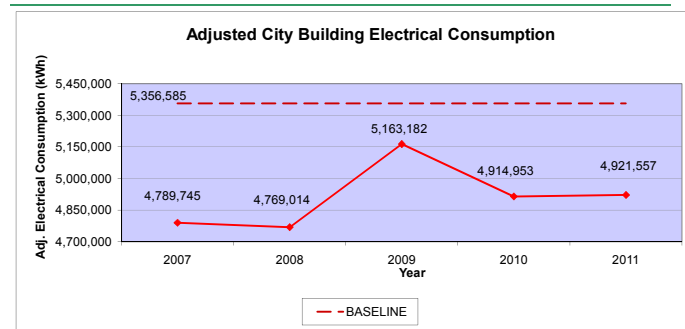


## Energy Sectors

- Building Sector
- Fleet Sector
- Street Light Sector



## Building Sector Electrical Consumption

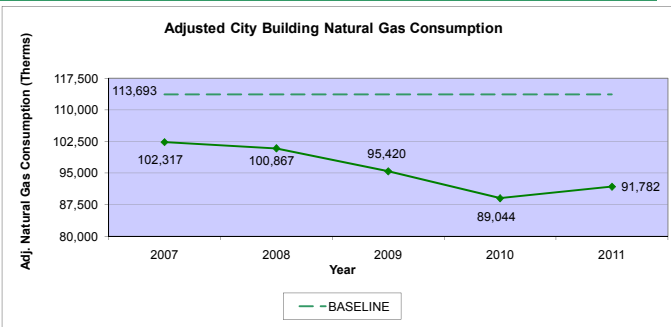


## Building Sector Electrical Consumption

Electricity Used - kWh, Adjusted for Degree Days and Bldg. Size				
Building or Department	BASELINE	2009	2010	2011
Airport	24,675	15,794	12,055	14,177
Animal Shelter	33,917	25,973	26,424	24,654
Cemetery	11,116	11,776	12,706	11,410
City Hall	2,110,237	2,049,903	1,914,982	1,834,057
Cy-Ride	367,352	430,803	459,434	458,197
Electric Administration	66,226	72,038	69,529	66,615
Electric Distribution	342,743	330,585	330,245	386,941
Fire Station 1	182,448	116,919	109,302	105,197
Fire Station 2	57,932	51,788	52,388	46,075
Fire Station 3	86,149	84,080	83,152	79,431
Golf Course	21,516	21,010	20,888	22,580
Ice Arena	1,116,920	1,062,293	949,514	1,033,111
Information Services	29,670	23,946	19,143	18,977
Library	653,878	612,066	623,833	609,936
Maintenance Facility	177,556	190,787	175,299	153,000
Parks Maintenance	14,972	20,019	17,785	21,591
Parks Office	59,279	43,402	38,274	35,607
<b>TOTAL BLDG. SECTOR</b>	<b>5,356,585</b>	<b>5,163,182</b>	<b>4,914,953</b>	<b>4,921,557</b>



## Building Sector Natural Gas Consumption

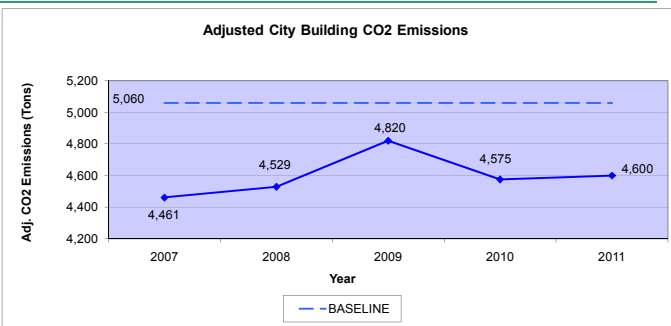


## Building Sector Natural Gas Consumption

Natural Gas Used - Therms, Adjusted for Degree Days and Bldg. Size				
Building or Department	BASELINE	2009	2010	2011
Airport				
Animal Shelter	3,737	2,812	2,715	2,502
Cemetery	1,810	1,615	1,417	1,639
City Hall	2,708	1,843	1,694	1,704
Cy-Ride	28,617	19,548	17,268	19,459
Electric Administration				
Electric Distribution				
Fire Station 1	7,783	6,239	5,746	5,346
Fire Station 2	2,688	2,552	2,318	2,188
Fire Station 3	6,496	6,367	6,518	5,437
Golf Course	1,375	1,741	1,352	1,465
Ice Arena	25,749	25,912	23,021	24,232
Information Services	674	198	674	579
Library	8,594	7,826	7,942	8,674
Maintenance Facility	19,017	14,064	13,748	13,789
Parks Maintenance	1,577	1,762	1,726	1,729
Parks Office	2,868	2,940	2,905	3,039
<b>TOTAL BLDG. SECTOR</b>	<b>113,693</b>	<b>95,420</b>	<b>89,044</b>	<b>91,782</b>



## Building Sector CO2 Emissions



## Building Sector CO2 Emissions

CO2 Emissions - Tons, Adjusted for Degree Days and Bldg. Size

Building or Department	BASELINE	2009	2010	2011
Airport	20	13	10	12
Animal Shelter	51	39	38	36
Cemetery	20	20	19	19
City Hall	1,745	1,691	1,579	1,513
Cy-Ride	466	474	483	496
Electric Administration	54	59	57	55
Electric Distribution	281	271	271	317
Fire Station 1	198	134	125	119
Fire Station 2	64	58	57	51
Fire Station 3	111	108	108	99
Golf Course	26	28	25	28
Ice Arena	1,072	1,030	920	996
Information Services	24	21	20	19
Library	589	550	560	553
Maintenance Facility	251	243	229	211
Parks Maintenance	22	27	25	28
Parks Office	66	54	49	48
<b>TOTAL BLDG. SECTOR</b>	<b>5,060</b>	<b>4,820</b>	<b>4,575</b>	<b>4,600</b>



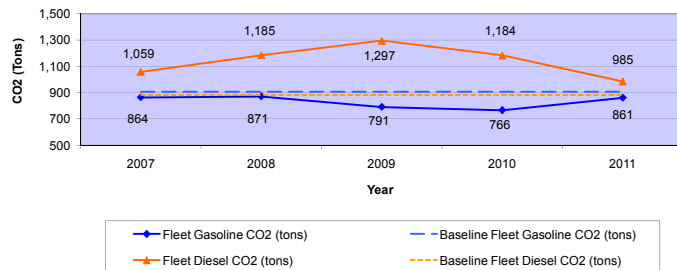
## Building Sector Carbon Footprint Reduction Summary

Building Sector Change Summary	2007	2008	2009	2010	2011	Total
Electric Consumption Change (kWh)	-566,840	-587,571	-193,403	-441,632	-435,028	-2,224,474
% Electric Consumption Change	-10.6%	-11.0%	-3.6%	-8.2%	-8.1%	
Natural Gas Consumption Change (Therms)	-11,376	-12,826	-18,273	-24,649	-21,911	-89,035
% Natural Gas Consumption Change	-10.0%	-11.3%	-16.1%	-21.7%	-19.3%	
CO2 Change (Tons)	-599	-531	-240	-485	-460	-2,315
% CO2 Change	-10.0%	-10.3%	-4.5%	-9.6%	-9.1%	



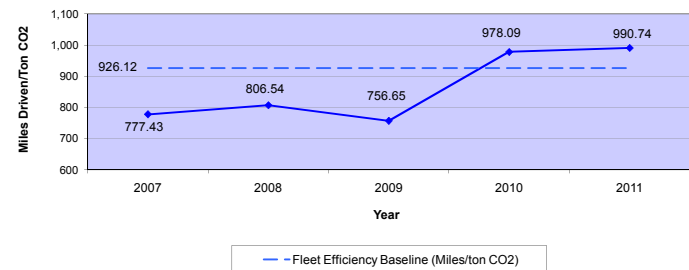
## Non-CyRide Fleet Sector Carbon Emissions

Non-CyRide Fleet CO2 Emissions



## Non-CyRide Fleet Sector Carbon Efficiency

Non-CyRide Fleet Efficiency in Miles/Ton CO2

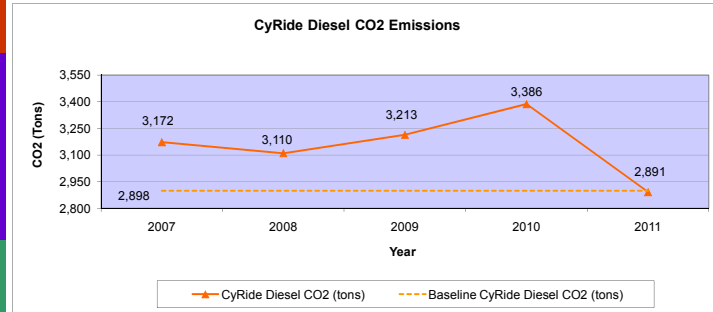


## Non-CyRide Fleet Sector Fuel Consumption

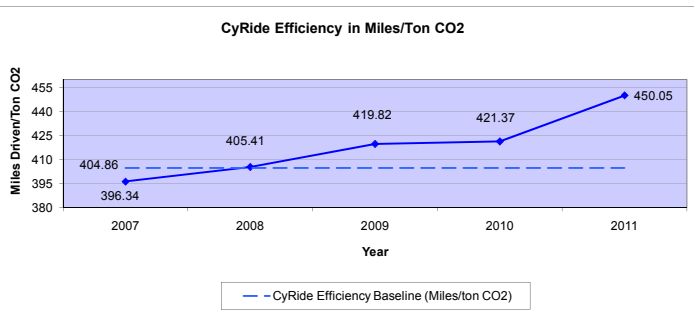
- ▣ **CO2 Decrease**
  - Drop in diesel use
    - ▣ Mild winter
  - However, also a drop in ethanol use
- ▣ **Increase in Efficiency**
  - 2011: 10% increase in miles, only 3% increase in CO2
  - Overall, Fleet is 7% more efficient than baseline years



## CyRide Fleet Sector Carbon Emissions



## CyRide Fleet Sector Carbon Efficiency



## CyRide Fleet Sector Fuel Consumption

- ▣ **Big Drop in CO2**
  - Combined MPG rose to 4.73
  - Gas usage still increasing with minibuses
- ▣ **Increase in Efficiency**
  - 2011: 19% increase in miles, only 7% increase in CO2
  - Overall, CyRide is 11% more efficient than baseline years
- ▣ **Increase in Ridership**
  - 1.4 million more riders in 2011 than in baseline years (34% increase)

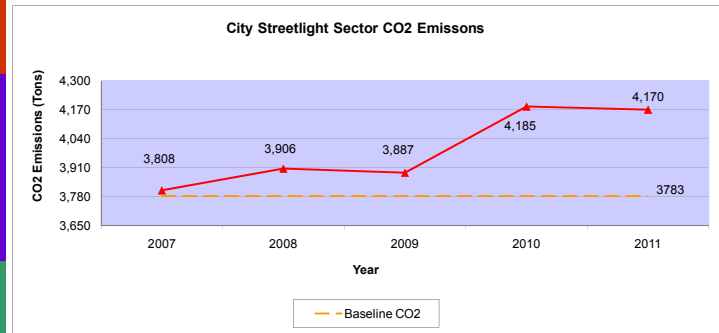


## Fleet Sector Carbon Footprint Reduction Summary

Fleet Sector Efficiency Change Summary						
	2007	2008	2009	2010	2011	Total
Non-CyRide Fleet CO2 Change From Baseline (Tons)	136	265	295	152	54	902
% Non-CyRide Fleet Efficiency (Miles/Ton CO2) Change From Baseline	-16.4%	-13.2%	-18.5%	5.8%	7.0%	
CyRide CO2 Change From Baseline (Tons)	275	213	317	609	212	1,626
% CyRide Efficiency (Miles/Ton CO2) Change From Baseline	-2.1%	-0.2%	3.7%	4.6%	11.2%	
Total Fleet Sector CO2 Change from Baseline (Tons)	411	478	612	761	266	2,528
% Total Fleet Sector Efficiency (Miles/Ton CO2) Change From Baseline	-10.6%	-6.5%	-8.5%	3.0%	7.9%	



## Streetlight Sector Carbon Footprint



## Streetlight Sector Carbon Footprint Reduction Summary

Street Light Sector						
Qty. of Units in Service	BASELINE	2007	2008	2009	2010	2011
Sirens	17	15	15	15	15	15
Bookmobile Sites	5	5	5	5	5	5
Parks	30	31	31	32	32	32
Traffic Signals	60	59	63	64	65	65
Streetlights	5,899	6,148	6,150	6,176	6,211	6,222
Pools	1	1	1	1	1	1

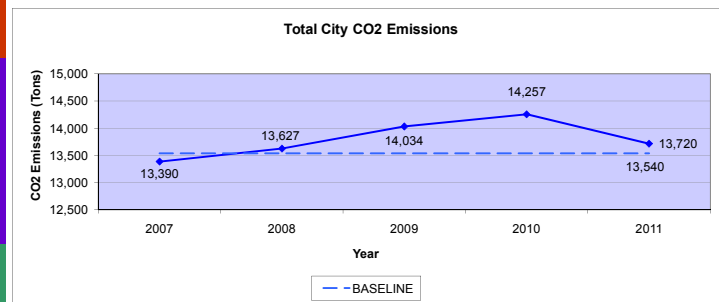
Street Light Sector						
CO2 (Tons)	BASELINE	2007	2008	2009	2010	2011
Sirens	0	0	0	0	0	0
Bookmobile Sites	1	1	1	1	1	1
Parks	128	165	169	159	164	137
Traffic Signals	379	225	202	184	173	200
Streetlights	3,225	3,365	3,482	3,492	3,501	3,491
Pools	50	52	52	51	346	341
Totals	3,783	3,808	3,906	3,887	4,185	4,170

387 Tons CO2 Increase (2011)

10.2% CO2 Increase (2011)



## City of Ames - Operations Total Carbon Footprint



## City of Ames - Operations Total Carbon Footprint

- ▣ **Decrease in Building Sector CO2**
  - 9.1% reduction in 2011
- ▣ **Increase in Fleet Sector Efficiency**
  - 7% increase in non-CyRide vehicle efficiency
  - 11.2% increase in CyRide vehicle efficiency
- ▣ **Streetlight Sector CO2 stays flat**
  - 9.4% increase due to City growth, Aquatic Center
  - This sector continues to be a challenge to make more efficient.



## Cool City CIP Projects

- ▣ \$400,000 in CIP for energy efficiency projects
- ▣ \$23,950 spent on energy audits of all facilities (except Library, Animal Shelter, and Plants)
  
- ▣ 14 projects completed
- ▣ 7 projects in progress
- ▣ 13 projects not yet started



## Cool City CIP Projects

- ▣ **Animal Shelter**
  - Originally to be funded by grant, donations
  - **Projects:**
    - ▣ HVAC
    - ▣ Thermostats
    - ▣ Sealing ductwork
    - ▣ T8 light fixtures
    - ▣ Attic insulation
    - ▣ Heat recovery ventilator
  
  - **Status: In Progress**



## Cool City CIP Projects

- ▣ **Fire Station 1**
  - **Projects:**
    - ▣ HVAC controls
    - ▣ On-demand water heater (to replace failing standard water heater)
    - ▣ Motion-activated lights
  
  - **Status: In Progress**



## Cool City CIP Projects

- ▣ Fire Station 2
  - Projects:
    - ▣ T8 light fixtures
    - ▣ Motion-activated lights
  - Status: Complete



## Cool City CIP Projects

- ▣ Fire Station 3
  - Projects:
    - ▣ HVAC controls
    - ▣ Motion-activated lights
  - Status: In progress



## Cool City CIP Projects

- ▣ Golf Course Clubhouse
  - Projects:
    - ▣ T8 light fixtures
    - ▣ HVAC controls
  - Status: In progress



## Cool City CIP Projects

- ▣ Parks Maintenance Building
  - Projects:
    - ▣ T8 light fixtures
    - ▣ LED exit signs
  - Status: In progress
  - T8 light fixtures were funded 50% by state grant funds



## Cool City CIP Projects

- Electric Administration
  - Projects:
    - Motion-activated lights
  - Status: Not yet started



## Cool City CIP Projects

- Electric Distribution
  - Projects:
    - Motion-activated lights
    - Loading dock apron seal
  - Status: In progress



## Cool City CIP Projects

- Parks and Recreation Office
  - Projects:
    - T8 light fixtures
    - Motion-activated lights
    - Retro-commission HVAC
  - Status: In progress
  - T8 light fixtures were funded 50% by state grant funds



## Cool City CIP Projects

- Maintenance Facility
  - Projects:
    - T8 light fixtures
    - Motion-activated lights
    - Retro-commission rooftop unit
    - Infrared heating
    - De-stratification fans
  - Status: In progress





## Cool City CIP Projects

- City Hall
  - Projects:
    - T8 light fixtures
    - LED exit signs
    - Motion-activated light switches
    - VFD on loop pumps
    - VFD on fluid cooler fans
    - Replace server room cooling units
  - Status: In progress



## Cool City CIP Projects

- Other projects:
  - Electric Distribution heat pump replacement – funds from state grant
  - Water well pump and motor downsizing – CIP and some state grant funds
  - Ice Arena – projects to be completed through a separate CIP



## Cool City CIP Projects

- Energy Management Plan
  - Focus on optimizing the use of the equipment in place by instilling energy-conscious habits, practices, and awareness among users
  - In development now
  - Implementation starting next year



## Questions ?

THANK YOU



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