

# CleanAir Cabs:

## Climate Change, Public Health, and Environmental Justice



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# BPHC

- ⦿ Board of Health for the City of Boston
- ⦿ Mission: To protect, preserve, and promote the health and well being of Boston's residents, particularly the most vulnerable

# Environmental & Occupational Health Division Mission

To respond to the full range of environmental and occupational public health issues in residences, public buildings, businesses, industry, and the environment, which pose a health threat to the citizens of Boston, particularly those most vulnerable.

# The Issues

- ⦿ 1,825 licensed taxi cabs in Boston
  - ⦿ Most used Crown Victorias (10mpg)
  - ⦿ Most owned by one person/company and leased daily or weekly to a driver
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- ⦿ Tailpipe emissions – asthma and other illness
  - ⦿ Greenhouse gas emissions
  - ⦿ Economic considerations

# History of CleanAir Cabs

April 2005	EOH approached by concerned citizen, John Moore, with the idea of hybrid cabs
Late 2005	Shopped the idea to BPD Hackney Division, MASSPort, City Hall, and ICLEI Local Government for Sustainability
Early 2006	Approval for use of Ford Escape and Toyota Camry hybrids as cabs by BPD
April/May 2006	Logan Airport offers 'front of line' privilege to hybrid cabs
June 2006	Receive grant from the Oak Foundation for incentives
Sept. 2006	First hybrid cab displayed at AltWheels festival on City Hall Plaza
Apr. 2007	Formal program launch



# The taxicab goes green

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**BOSTON** That's not a racing stripe seen running down the side of a Boston taxicab. More accurately, it's a sign of hope for a cleaner city.

Adorned with a unique green stripe that sets it apart from the rest of the fleet, the city's first hybrid taxi was introduced to the streets this weekend as part of the Alt Wheels Festival.

"This is yet another example of how we can partner with an important industry serving Boston's residents and visitors to reduce impacts on public health and environment," Mayor Thomas Menino said.

A hybrid cab in Boston was originally the idea of John Moore, a local architect who first pitched the idea to the city but was told he needed some numbers to back up his proposal. So Moore went to work, following a cab for 10 hours in a hybrid to see how much of a difference it would make.

While the cab burned 12 gallons of gas, the hybrid spent just over three.

"That was all they needed to see," said Moore, who launched Boston CleanAir



**MAYOR THOMAS MENINO** steps into the city's first hybrid taxi, a Toyota Camry introduced to Boston's streets this past weekend.

Cabs soon thereafter.

Moore thought he would surrender the idea if and when he met objections, but he never did. "It's just a great idea," he said. "It helps everyone — the driver, the passenger, the citizens [of Boston]."

Chosen by the Boston Cab

Association to be the first to drive the Toyota Camry, Festus Igharo, a native of Nigeria, has received nothing but positive returns.

"When people get in the car they say, 'I wish all taxis in Boston were like this,'" Igharo said.

Moore hopes to have 100 hybrid taxis on the road within a year. No new medallions are being offered, so the new vehicles would simply replace the old Crown Victorias currently clogging both cab stands and, in reality, the city's air.









Image from Wikimedia.org





Hybrid Taxi Test: 4/16/2005								
					Moving	Moving	Stopped	Stopped
Time	Action	Location	Fare?	Odmtr	w/fare	w/o fare	At Stand	Waiting
1:24:00 PM	Arrive pickup	Somerville	n	6932	0:00:00	0:05:40		
1:26:00 PM	Leave pickup		y				0:00:00	0:02:00
1:34:00 PM	Arrive dropoff	Somerville	y	6934	0:08:00	0:00:00		
1:35:00 PM	Leave dropoff		n				0:00:00	0:01:00
1:42:00 PM	Arrive pickup	Cambridge	n	6936	0:00:00	0:07:00		
1:45:00 PM	Leave pickup		y				0:00:00	0:03:00
1:53:00 PM	Arrive dropoff	Cambridge	y	6938	0:08:00	0:00:00		
1:54:00 PM	Leave dropoff		n				0:00:00	0:01:00
2:05:00 PM	Arrive stand	Cambridge	n	6940	0:00:00	0:11:00		
2:07:00 PM	Leave stand		n				0:02:00	0:00:00
2:09:00 PM	Arrive pickup	Cambridge	n	6940.5	0:00:00	0:02:00		
2:11:00 PM	Leave pickup		y				0:00:00	0:02:00
2:32:00 PM	Arrive dropoff	Airport	y	6947	0:21:00	0:00:00		
2:33:00 PM	Leave dropoff		n				0:00:00	0:01:00
2:48:00 PM	Arrive stand	Somerville	n	6953	0:00:00	0:15:00		
2:51:00 PM	Leave stand		n				0:03:00	0:00:00
2:54:00 PM	Arrive pickup	Somerville	n	6953.5	0:00:00	0:03:00		
2:56:00 PM	Leave pickup		y				0:00:00	0:02:00
3:01:00 PM	Arrive dropoff	Somerville	y	6954	0:05:00	0:00:00		
3:08:00 PM	Leave dropoff		n				0:00:00	0:07:00
3:11:00 PM	Arrive stand	Somerville	n	6955	0:00:00	0:03:00		
3:25:00 PM	Leave stand		n				0:14:00	0:00:00
3:26:00 PM	Arrive pickup	Somerville	n	6955.5	0:00:00	0:01:00		
3:27:00 PM	Leave pickup		y				0:00:00	0:01:00
3:50:00 PM	Arrive dropoff	Somerville	y	6959	0:23:00	0:00:00		
3:50:20 PM	Leave dropoff		n				0:00:00	0:00:20
4:07:00 PM	Arrive pickup	Somerville	n	6963	0:00:00	0:16:40		
4:08:00 PM	Leave pickup		y				0:00:00	0:01:00
4:15:00 PM	Arrive dropoff	Somerville	y	6964	0:07:00	0:00:00		
4:17:00 PM	Leave dropoff		n				0:00:00	0:02:00
4:20:00 PM	Arrive pickup	Somerville	n	6965	0:00:00	0:03:00		
4:23:00 PM	Leave pickup		y				0:00:00	0:03:00
4:32:00 PM	Arrive dropoff	Somerville	y	6967	0:09:00	0:00:00		
4:35:00 PM	Leave dropoff		n				0:00:00	0:03:00
4:44:00 PM	Arrive pickup	Somerville	n	6969	0:00:00	0:09:00		
4:45:00 PM	Leave pickup		y				0:00:00	0:01:00
4:57:00 PM	Arrive dropoff	Somerville	y	6972	0:12:00	0:00:00		
4:58:00 PM	Leave dropoff		n				0:00:00	0:01:00
5:06:00 PM	Arrive pickup	Somerville	n	6973	0:00:00	0:08:00		
5:07:00 PM	Leave pickup		y				0:00:00	0:01:00
5:24:00 PM	Arrive dropoff	Back Bay	y	6978	0:17:00	0:00:00		
5:24:20 PM	Leave dropoff		n				0:00:00	0:00:20
5:40:00 PM	Arrive HQ	Somerville	n	6984	0:00:00	0:15:40		
9:02:00 hours		TOTALS:	17	97.0	3:14:40	3:27:40	1:11:00	1:08:40
Vehicles:								
	??? Crown Victoria	181,280 mi.	10.25	gallons used		\$22.03 (\$2.149/gal)		
	2005 Escape (4WD)	6,887 mi.	3.77	gallons used		\$8.10		

# **Camry Fuel Use** **Data**

<b>Fill-up Date</b>	<b>Gas Used (gallons)</b>	<b>Gas Used (dollars)</b>	<b>Gas Price (\$/gallon)</b>	<b>Odometer Reading</b>	<b>Miles Traveled</b>	<b>Mileage (miles/gallon)</b>
10/5/06	n/a	n/a	n/a	5240	n/a	n/a
10/7/06	10.597	\$22.88	\$2.16	5603	363	34.3
10/10/06	8.570	\$18.33	\$2.14	5897	294	34.3
10/11/06	8.658	\$18.52	\$2.14	6184	287	33.1
10/13/06	8.357	\$17.54	\$2.10	6474	290	34.7
10/16/06	11.812	\$24.79	\$2.10	6862	388	32.8
10/18/06	9.904	\$20.59	\$2.08	7203	341	34.4
10/20/06	9.833	\$20.44	\$2.08	7534	331	33.7
10/21/06	6.943	\$14.43	\$2.08	7752	218	31.4
10/23/06	10.040	\$20.87	\$2.08	8072	320	31.9
10/26/06	10.317	\$21.45	\$2.08	8413	341	33.1
10/28/06	11.319	\$23.19	\$2.05	8783	370	32.7
10/31/06	11.647	\$24.21	\$2.08	9190	407	34.9
11/2/06	9.415	\$19.57	\$2.08	9521	331	35.2

**Totals:**

<b>28 days</b>	<b>127.41 gallons</b>	<b>\$266.81</b>	<b>\$2.09 (average)</b>
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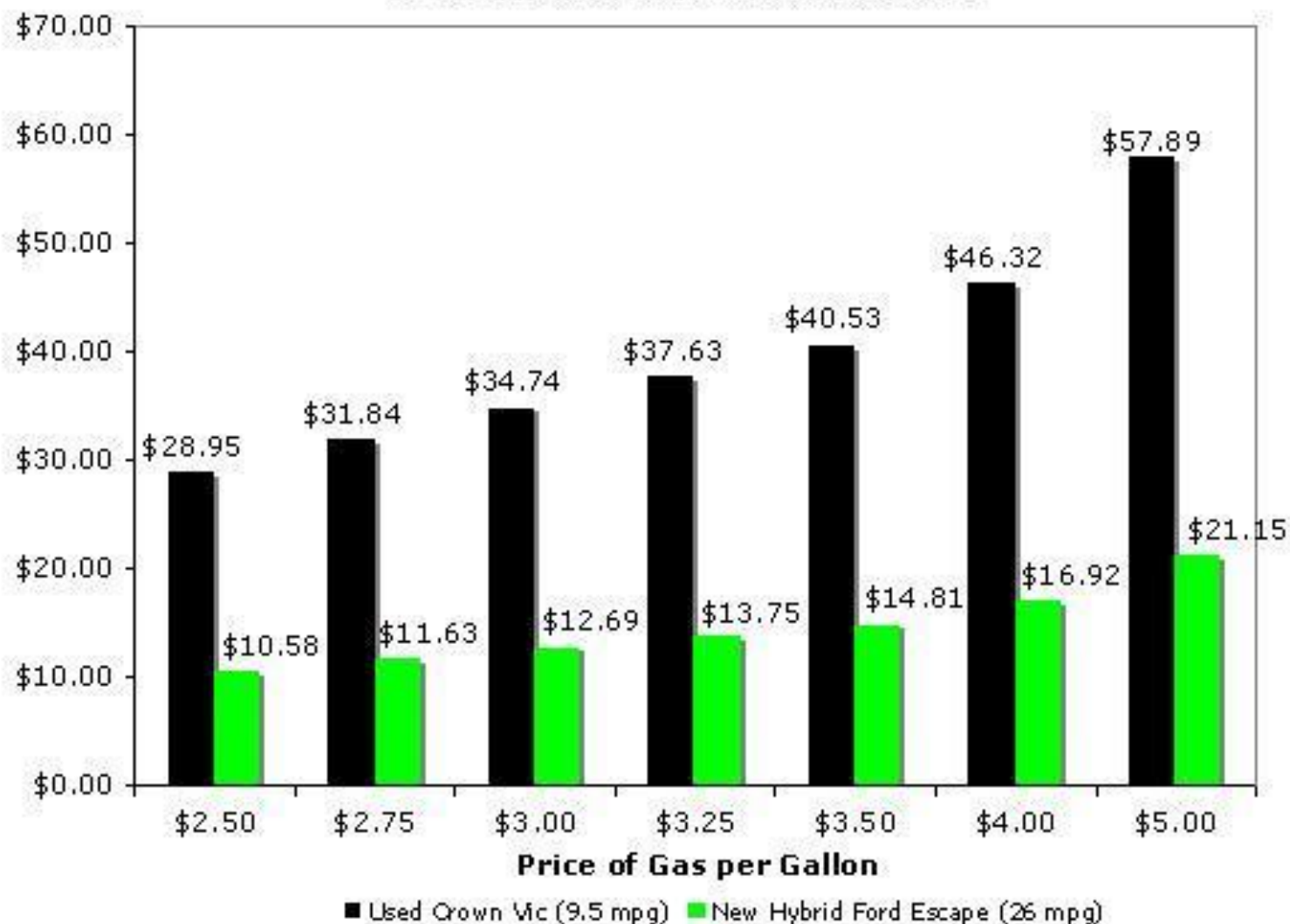
<b>4281 miles</b>	<b>33.6 (average)</b>
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John W. Moore

**Source:** Boston CleanAir CABS  
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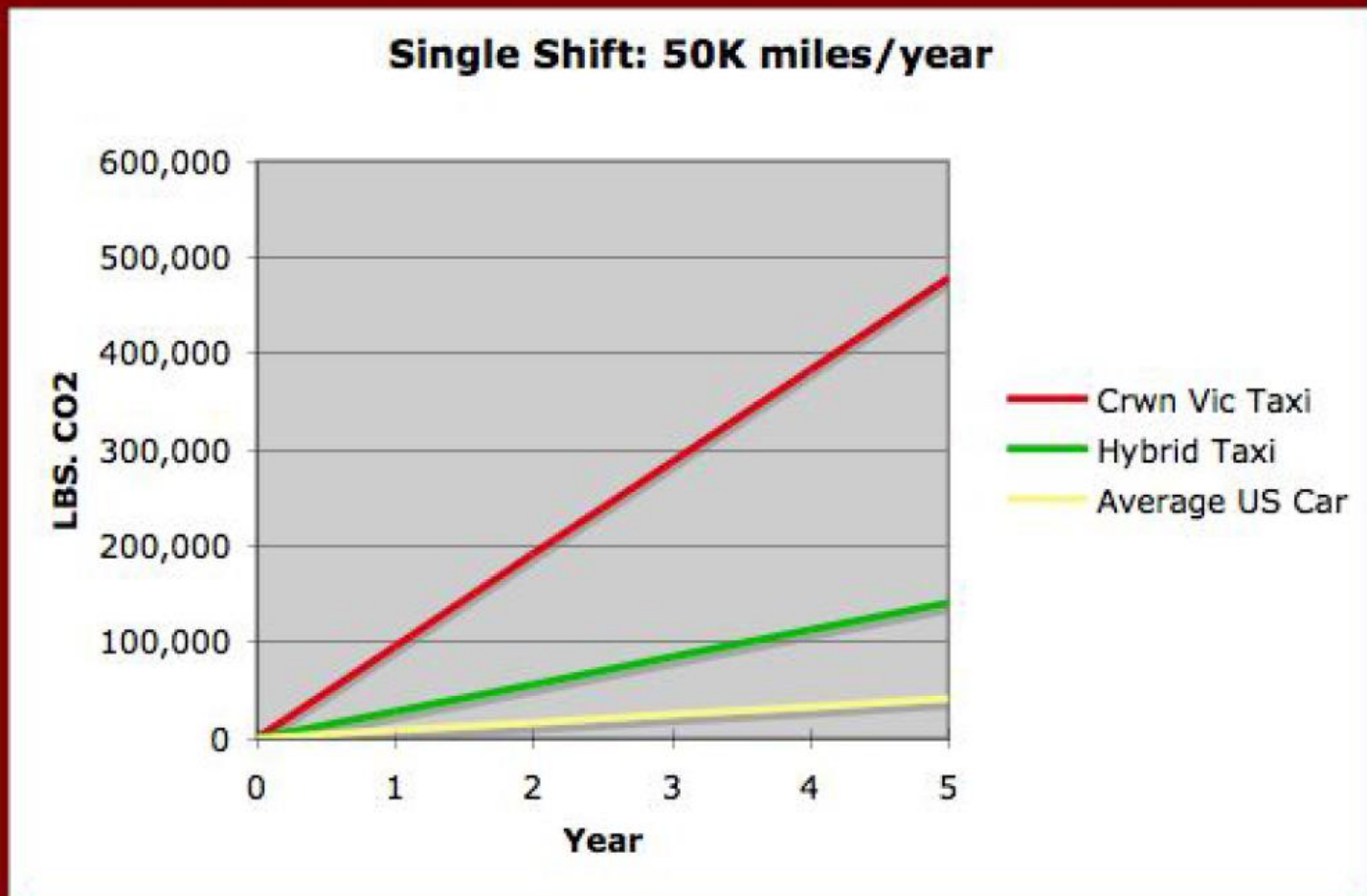


**TAXI FUEL COST PER 110 MILE SHIFT**





# Greenhouse Gas Emissions



- 5 Yr CO2 savings replacing Boston taxi with Hybrid: **300 - 500,000 lbs.**
- 1 Gallon = 19 lbs. CO2 (single - double shift)

## Since Then....

- ⦿ August 2008 – City mandates all cabs in fleet convert by 2015
- ⦿ March 2009 – Medallion owners sued in Federal Court, blocking the order
- ⦿ 2012 – City awards Boston Cab Association with the Green Business Award for converting 400/500 cabs

## Impact

- 1,828 taxi medallions in Boston
- 1,787 currently on the road
- 861 (48% of cabs on the road) are hybrids



# Climate Change & Co-Benefits

- ~6,300 gallons of gasoline saved per cab per year (assume 100,000 miles)
  - > 119,700 pounds of CO<sub>2</sub> emissions prevented
  - > \$15,750 gas savings for the driver(s)
  - > ~\$5,000 increased income to the medallion owner
- ~5,424,300 gallons of gasoline saved every year by the fleet
  - > ~51,530 tons of CO<sub>2</sub> reduced per year
  - > Over 250,000 tons over 5 years
- Asthma ED visits decreased despite no change in the rate (12%) of adults with asthma
  - > 11/1,000 in 2003
  - > 10.12/1,000 in 2015
- Cab drivers report higher customer satisfaction

# Lessons Learned

- ⦿ Coalition building - engaging gatekeepers and peers
- ⦿ “Speak the language of the audience”
  - Health, Finance, Safety, Climate, Prestige
- ⦿ Limited time incentives to get from early adopters to critical mass
- ⦿ Leading by example

# Remaining & Emerging Challenges

- ⦿ Getting the rest of the cabs
- ⦿ Reducing personal vehicle traffic
- ⦿ Uber and Lyft
- ⦿ What's the next step after hybrids?