

# Reducing Oil Consumption, Traffic Congestion and Pollution: Making New York City Motor Scooter Friendlier

Piaggio Group Americas, Inc.


New York, October 23rd 2008



aprilia



PIAGGIO®



Vespa®

# Three Interrelated Concerns are Affecting our Societies

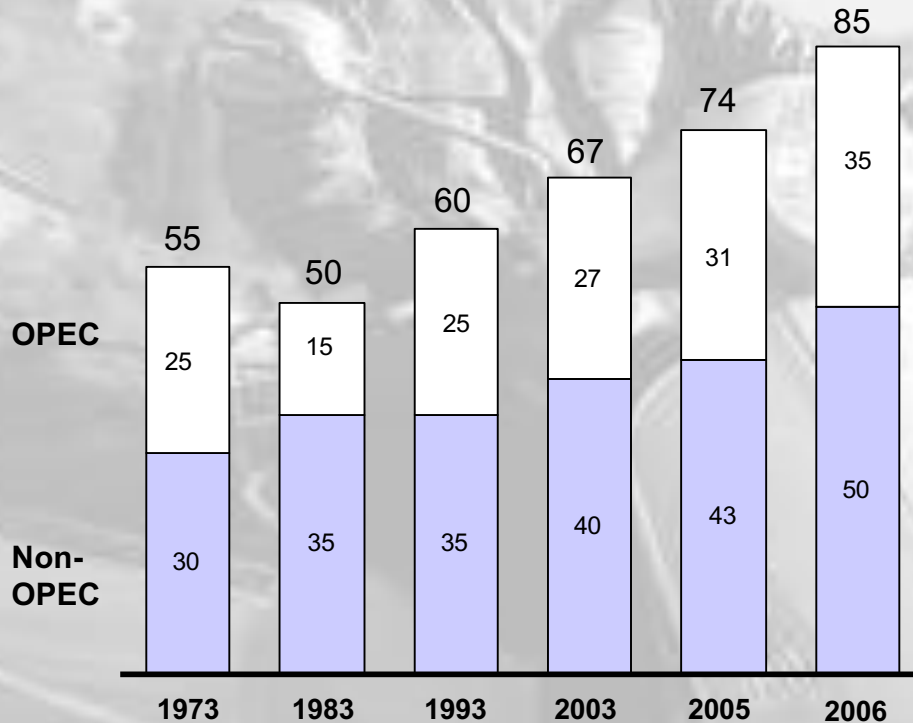


- Energy crisis driven by rapidly increasing oil prices
- Global warming driven by ever increasing carbon dioxide emissions
- Americans are losing hours of their day in ever worsening traffic congestion

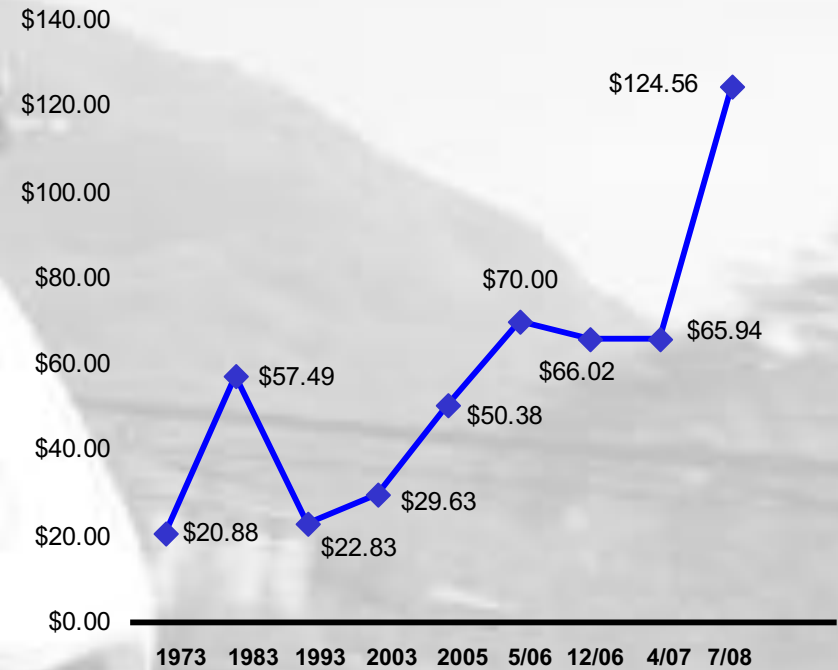
# Crude Oil Demand Accelerating and Oil Prices Sky-Rocketing



**Crude Oil Production**  
Million barrels per day



**Crude Oil Inflation Adjusted Prices**  
December 2005 CPI-U adjusted \$

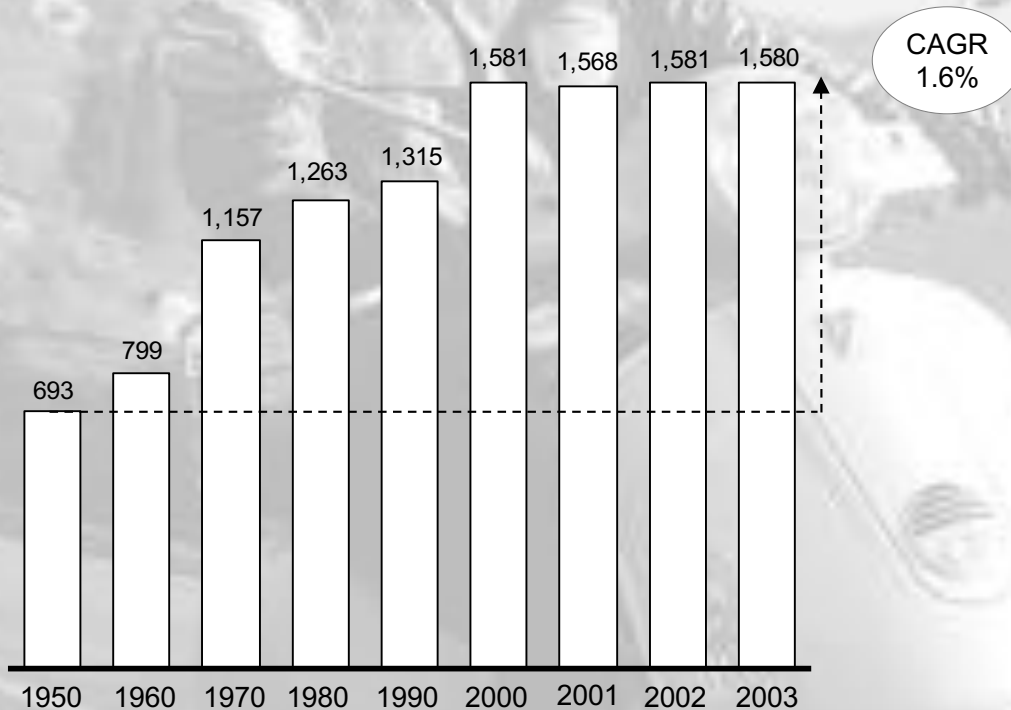


- Accelerating Demand
- Political instability in oil producing countries
- Terrorism

# Carbon Dioxide (CO<sub>2</sub>) Emission Continue to Increase



**USA CO<sub>2</sub> Fossil Fuel Emissions**  
Million Metric Tons



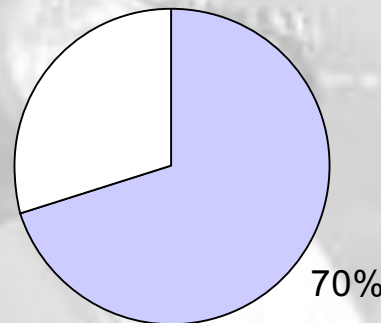
- Despite complexity of science, greater consensus is emerging regarding relationship between global warming and CO<sub>2</sub> emissions

# Americans agree that Global Warming is a Serious Issue



## Americans Concern of Global Warming

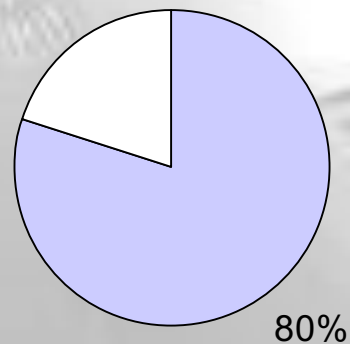
---



**Extremely or  
Somewhat  
Concerned**

## Agree Urgent Government Action Is Needed to Improve Global Warming Situation

---

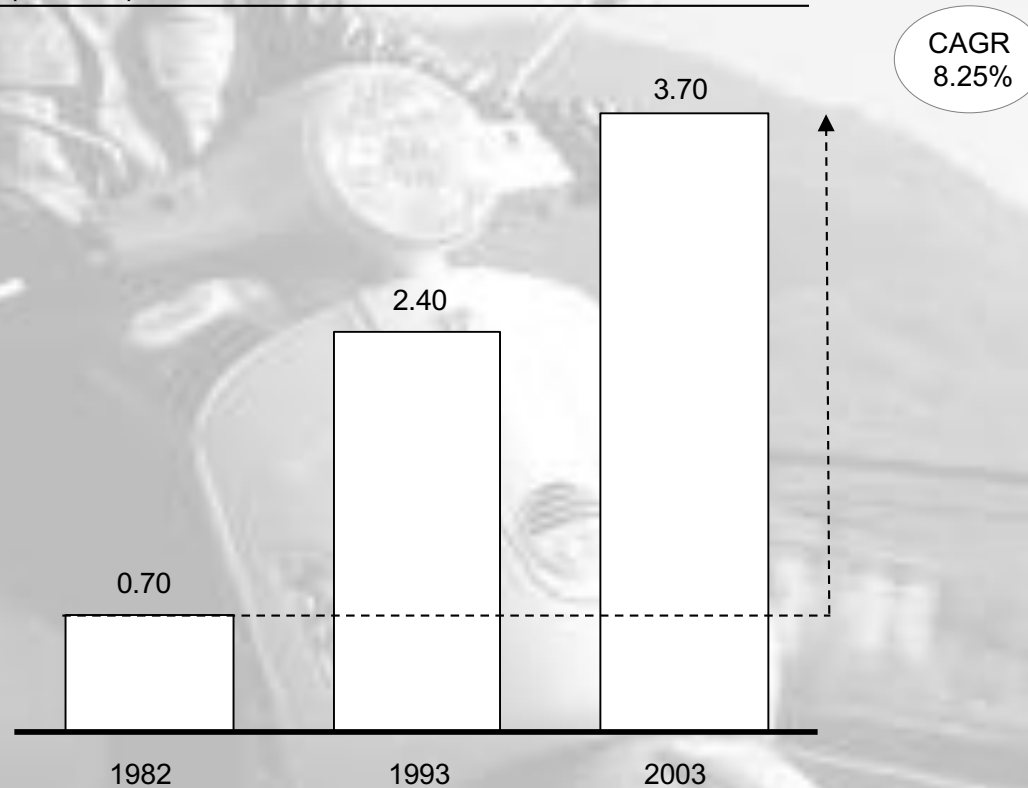


80%

# Traffic Congestion is Becoming Worse and Worse



**Americans Hours Lost due to Traffic Congestion  
(Billions)**



# TTI & Annual Delay Per Person 2003



City	TTI	Annual Delay (hr)	Excess Fuel (1000 Gal/yr)
Los Angeles	1.75	93	407,147
Chicago	1.57	58	150,728
San Francisco	1.54	72	96,571
Washington DC	1.51	69	87,567
Atlanta	1.46	67	70,829
Miami	1.42	51	87,249
Houston	1.42	63	80,707
San Diego	1.41	52	59,215
New York	1.39	49	198,217
Las Vegas	1.39	30	14,354
Detroit	1.38	57	72,796
Riverside/San Bernardino	1.37	55	34,952
Dallas/Fort Worth	1.36	60	82,862
Phoenix	1.35	49	43,988
Boston	1.34	51	59,556

# TTI & Annual Delay Per Person 2003



<b>City</b>	<b>TTI</b>	<b>Annual Delay (hr)</b>	<b>Excess Fuel (1000 Gal/yr)</b>
Austin	1.33	51	14,073
Tucson	1.31	36	8,424
Charlotte	1.31	43	10,564
Salt Lake City	1.28	31	9,821
Richmond. VA	1.09	17	4,763



## Cities will see a **65%** increase in delays by 2028

The cities below will experience congestion that is as bad as Los Angeles today (93hr and 407M gal/yr):

Boston, MA	Baltimore, MD	San Diego, CA
Miami, FL	Orlando, FL	Riverside, CA
Denver, CO	Austin, TX	San Jose, CA

2003

City	Annual Delay (hr)	Excess Fuel (1000 Gal/yr)
Los Angeles	93	407,147

2028

Los Angeles	153	672,000
-------------	-----	---------

# New Technologies will Provide Long-Term Solutions for Cheap and Clean Energy

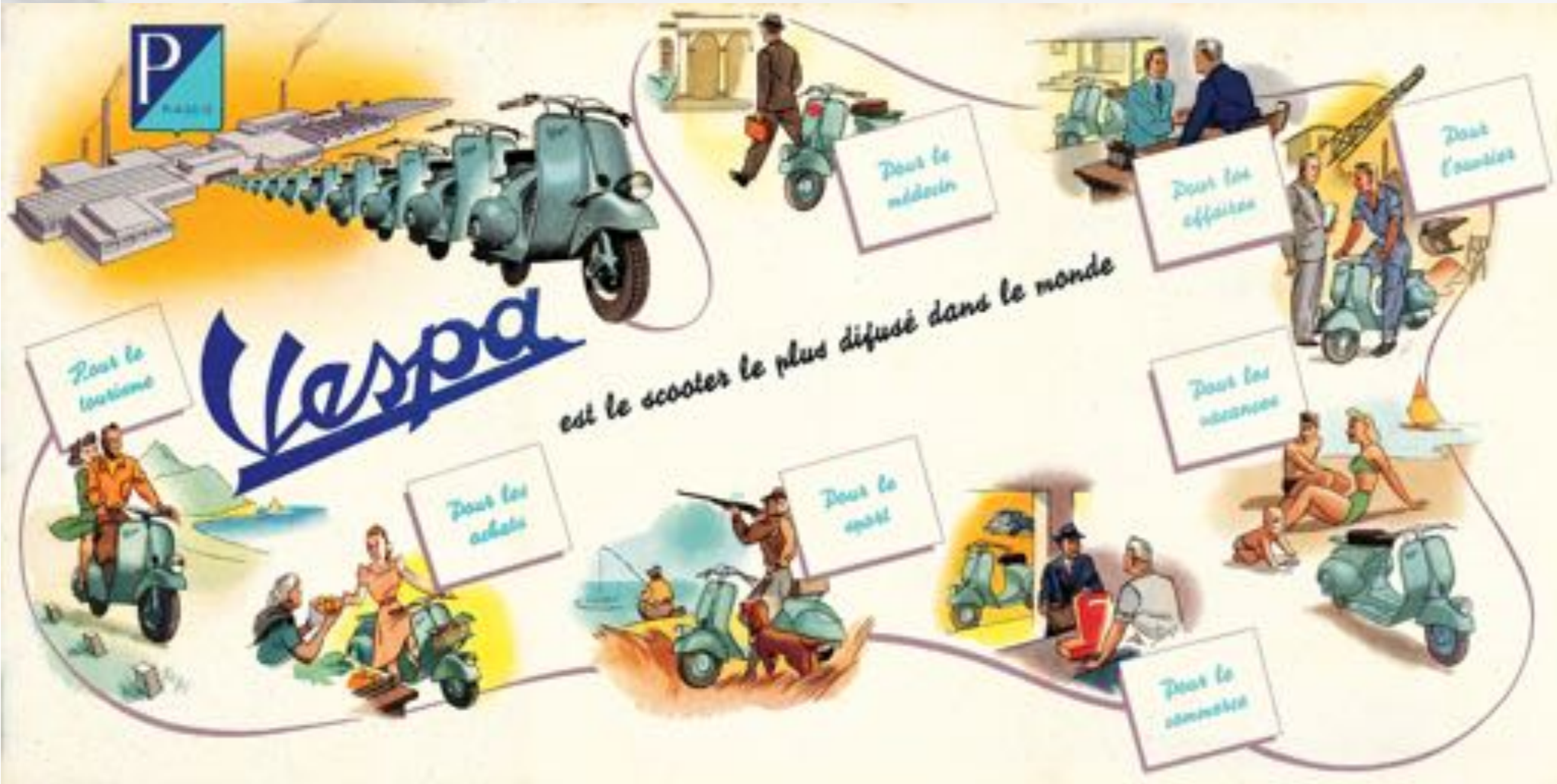


- Wind and solar energy power
- Hydrogen fuel cells
- More efficient combustion engines
- Ethanol and bio-diesel
- Geothermal and Hydro
- Nuclear
- Waste-to-energy and clean coal

## Transportation Options

- Hybrid cars
- Ethanol
- Bio-diesel
- More efficient combustion engines
- Public Transportations
- Motor scooters

# Motor Scooters Became a Mainstream Transportation Solution in the 1950's (cont.)



# Today Motor Scooters are Widely Used for Urban Transportation in Both Europe and Asia



## Florence, Italy



## London, UK



## Paris, France



## Spain

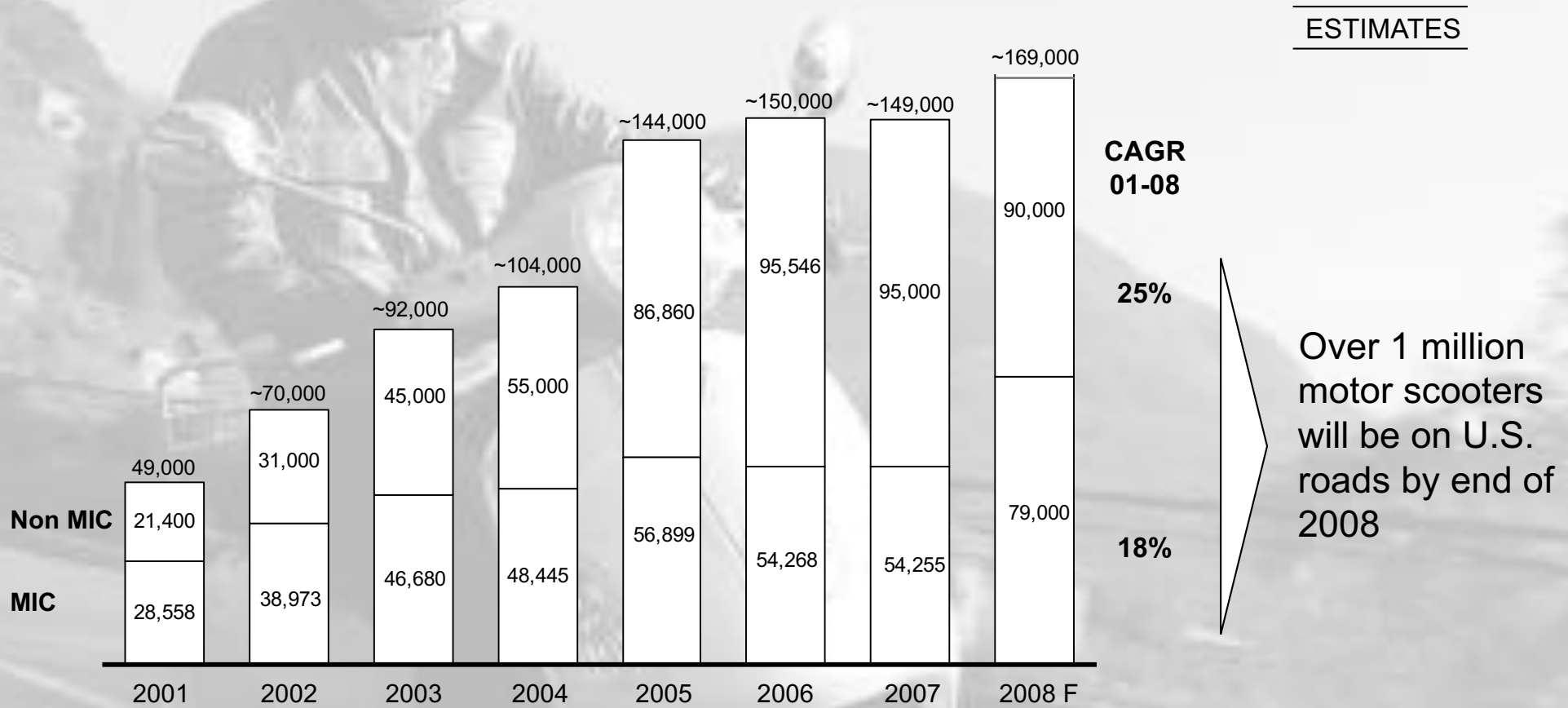




## Taipei, Taiwan



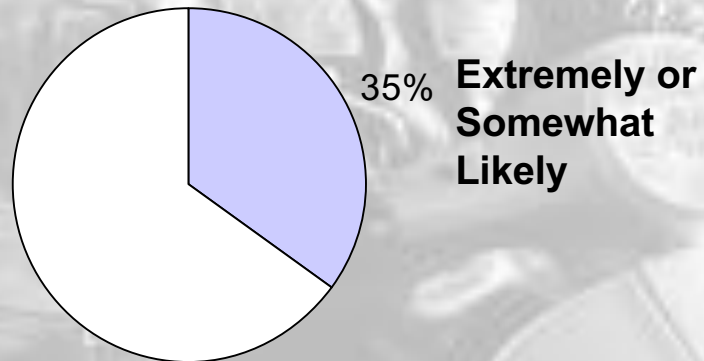
# Motor Scooters Rapidly Emerging as a Transportation Solution in the US



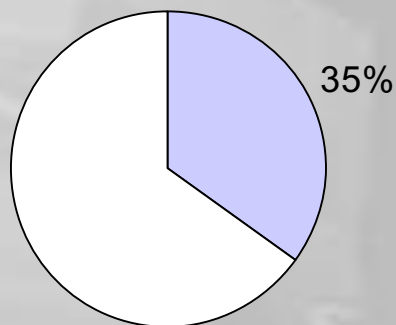
# The Number of Americans that Could Start Using a Motor Scooter is Potentially Very High



## Drivers that Would Consider Using a Motor Scooter



## Average Share of Total Mileage that Would shift to a Motor Scooter



## Resulting Benefits

- **Reduced oil consumption of 14-18 million gallons per day**
- **Decreased CO<sub>2</sub> emissions of 320 million lbs. per day**

# Motor Scooters are Starting to Change the Landscape of U.S. Cities Too



## San Francisco, CA



# Usage of Motor Scooters is Also Spreading Among Public Administrations

---

**New York**

---



# Usage of Motor Scooters is Also Spreading Among Public Administrations (cont.)

## New Orleans



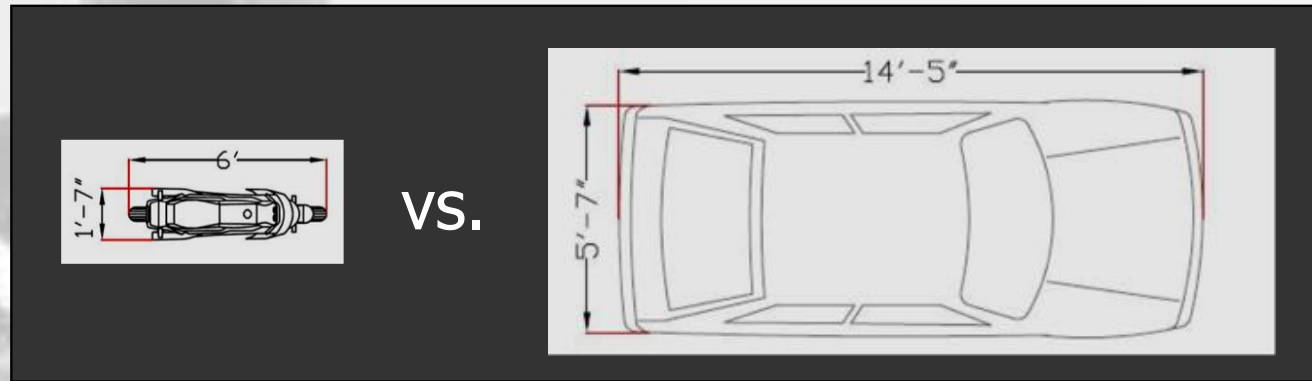
# Usage of Motor Scooters is Also Spreading Among Public Administrations (cont.)



## Savannah



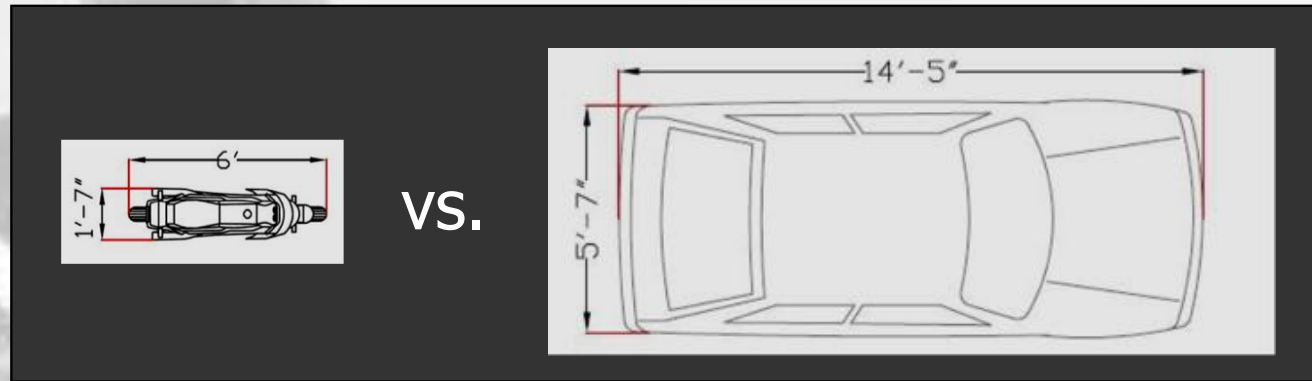
# Why Motor Scooters



- Reduce Congestion
  - Scooters take up  $\frac{1}{2}$  the driving space of a car
  - Scooters take up  $\frac{1}{7}$  the parking space of a car
- Less Threat to Pedestrians and Cyclists (safer)
- Better Fuel Efficiency
  - Motor scooters average 70 mpg (better than the Prius)
  - Costs less than \$600 to operate annually, significantly less than a car\*
- Less CO2 Emissions per mile
  - Scooters emit significantly less than the standard or hybrid car
- Less Noise Pollution
- Scooters are a complement to bicycles for medium to long range commuting



# Why Motor Scooters



- Reduce Congestion
- Less Threat to Pedestrians and Cyclists (safer)
- Better Fuel Efficiency
- Less CO2 Emissions per mile
- Less Noise Pollution

# Reduce Congestion: Purpose



To determine if a modal shift from four-wheeled vehicles to two-wheeled vehicles will impact traffic congestion in New York City

# Simulation of 20% Modal Shift



- Synchro and VISSIM Traffic Simulations
- 41st Street to 43rd Street and 1st Avenue to 8th Avenue (sampling of actual count)
- Results extrapolated to the Central Business District\*

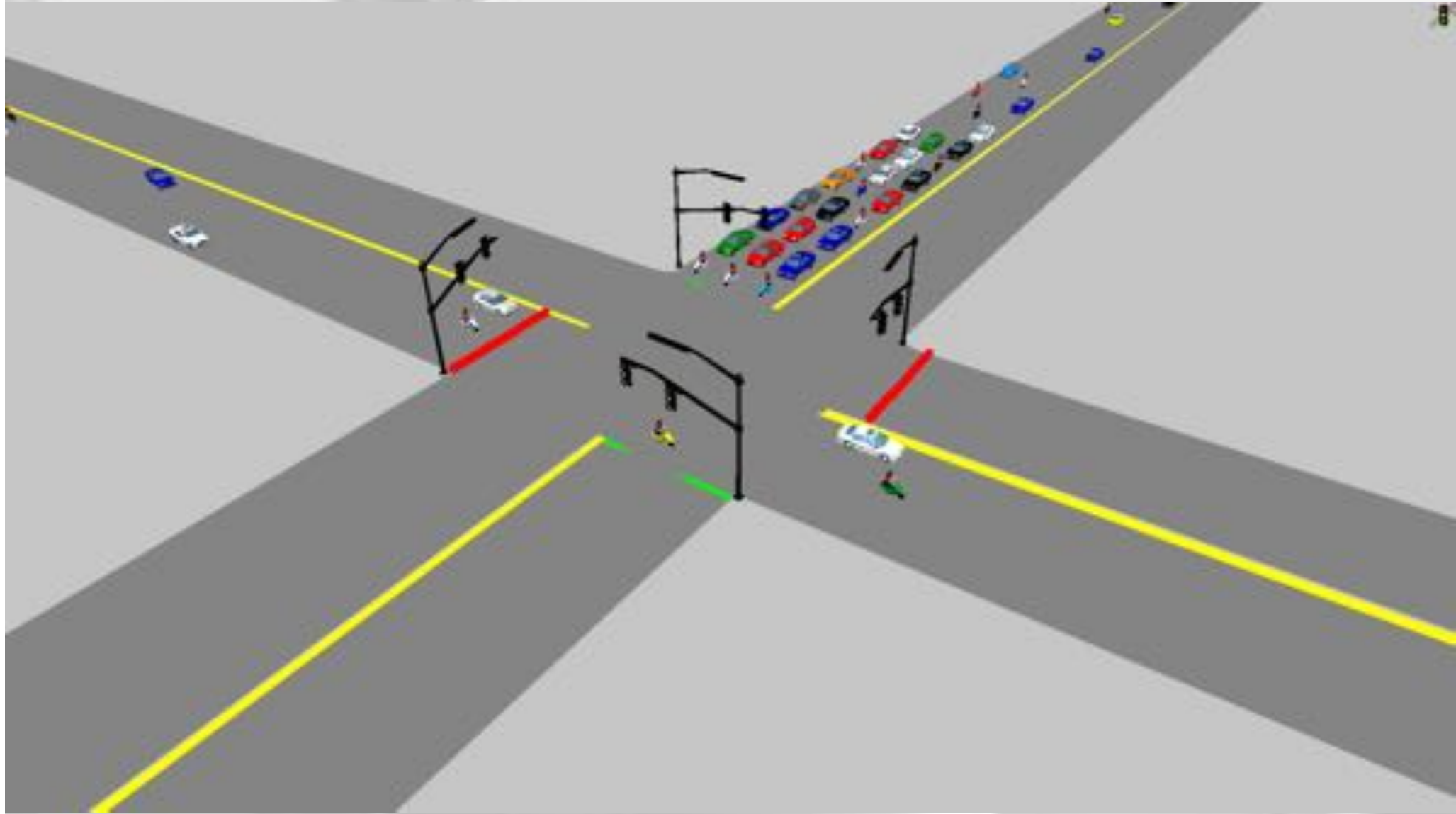
\* *The CBD is the borough of Manhattan, bounded by the Battery to the south and 62nd Street to the north.*

# Simulation of 20% Modal Shift

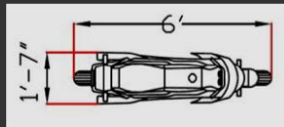


- Annual delay decrease in Central Business District (CBD)\* > 4.6 million hours
  - ~100 hours per person
- Annual fuel consumption decrease for the CBD > 2.5 million gallons
- Pollution Reduction
  - CO2 emissions > 26,000 tons
  - Particulate > 2.7 billion mg per year
- Total savings for the CBD = \$122 million per year in fuel and labor productivity savings (or \$2,600 per driver)

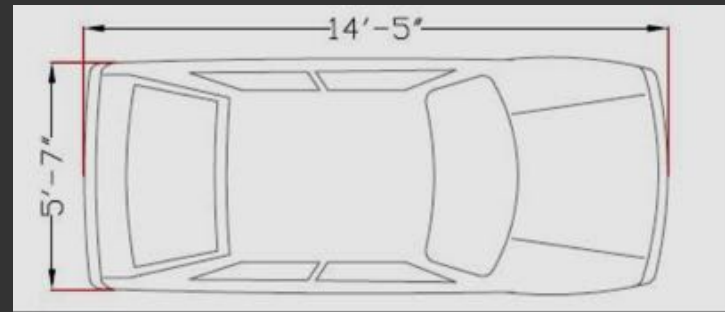
# Simulation of 20% Modal Shift



# Why Motor Scooters



VS.



- Reduce Congestion
- Less Threat to Pedestrians and Cyclists (safer)
- Better Fuel Efficiency
- Less CO2 Emissions per mile
- Less Noise Pollution

# Safety Data: Purpose



To determine if a modal shift from four-wheeled vehicles to two-wheeled vehicles will impact the overall safety of New York City

# Methodology



- Researched New York City fatality rate per vehicle miles traveled (VMT) for:
  - Passenger cars
  - Motorcycles and scooters (<500 cc)
  - Trucks not included in the study for conservatism
- New York City vehicle fatality data obtained from NYSDMV Summary of NYC Motor Vehicle Accidents 2003-2005
- NYC fatality rates per VMT includes occupant and non-occupant (pedestrian) fatalities



# Results



## 2003 -2005 New York City Fatality Rate

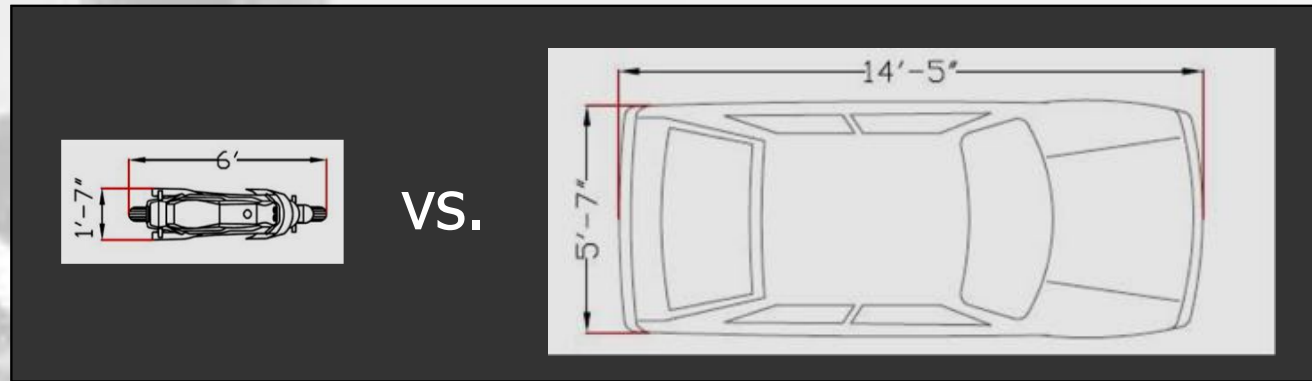
	Fatalities (Occupant)	Non-Occupant Fatalities (Pedestrians)	VMT (100 Mil Miles)	Fatality Rate per 100 Mil VMT
<b>2003</b>				
Motorcycle/Scooter <500cc	<b>2</b>	<b>0</b>	<b>5.73</b>	<b>0.32</b>
Vehicles	<b>166</b>	<b>178</b>	<b>964.47</b>	<b>0.36</b>
<b>2004</b>				
Motorcycle/Scooter <500cc	<b>1</b>	<b>0</b>	<b>6.12</b>	<b>0.24</b>
Vehicles	<b>127</b>	<b>171</b>	<b>984.68</b>	<b>0.30</b>
<b>2005</b>				
Motorcycle/Scooter <500cc	<b>2</b>	<b>0</b>	<b>6.55</b>	<b>0.30</b>
Vehicles	<b>147</b>	<b>181</b>	<b>981.99</b>	<b>0.33</b>
<b>Summary (2003-05 Combined)</b>				
Motorcycle/Scooter <500cc	<b>5</b>	<b>0</b>	<b>18</b>	<b>0.29</b>
Vehicles	<b>440</b>	<b>530</b>	<b>2931</b>	<b>0.33</b>

Source: NYS DMV Summary of Motorcycle Accidents 2003-2005 & Summary of Motor Vehicle Accidents 2003-2005; NHTSA NCSA Traffic Safety Facts 2005: Motorcycles, NCSA FARS/GES 2005 Data Summary; NCSA FARS Web-Based Encyclopedia 2003-2005; Functional System Travel 2003-2005 Annual Vehicle-miles; NYS DMV Summary of NYC Motor Vehicle Accidents 2003-2005

# Conclusions from Safety Data

- Overall fatality rates per VMT for motorcycles and scooters were *lower* than those for passenger cars
- Modal shift to motor scooters increases overall safety of NYC streets

# Why Motor Scooters



- Reduce Congestion
- Less Threat to Pedestrians and Cyclists (safer)
- Better Fuel Efficiency
- Less CO2 Emissions per mile
- Less Noise Pollution

# Fuel Efficiency & Emissions



- Consume significantly less fuel per mile (68-75 MPG on average)
  - 57% fuel savings versus the average car
  - 71% of fuel savings versus the average SUV or light truck

	MPG	CO2 (lbs/mi)
Vespa LX150	72	.26
Average Car	30	.916
Average SUV	18-23	1.15

- Drastically reduce CO<sub>2</sub> emissions
  - 72% less than average passenger car
  - 78% less than average SUV or light truck
- European and Japanese manufactured scooters meet Euro 2 or Euro 3 emissions requirements

	Hydrocarbons (g/km)	Nitrogen Oxides (g/km)	Hydrocarbons + NOX (g/km)	Carbon Monoxide (g/km)
Euro 2	1.00	.30	1.3	5.50
<b>Euro 3</b>	<b>.30</b>	<b>.15</b>	<b>.45</b>	<b>2.0</b>
EPA	1.0	N/a	1.4	12.00
CARB (2008)	1.0 – 1.4 (2004)	N/a	0.8 (2008)	12.00

Source: Cycle World, EPA- fueleconomy.gov; EPA - Green Vehicle Guide.

Note: Comparisons made to 2005-2006 model year vehicles – SUV: 5.3L (or similar – range 2-3 emissions score) Avg Car – 4-6L (or similar – range 4-6 emissions score)

# Emission Reduction Process



## Innovations in engine management:

- Two way oxidation catalyst
- Secondary air injection
- 3 way catalyst with oxygen sensor control
- Electronic engine management
- Fuel injection



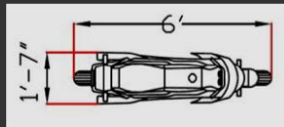
All often used in combination



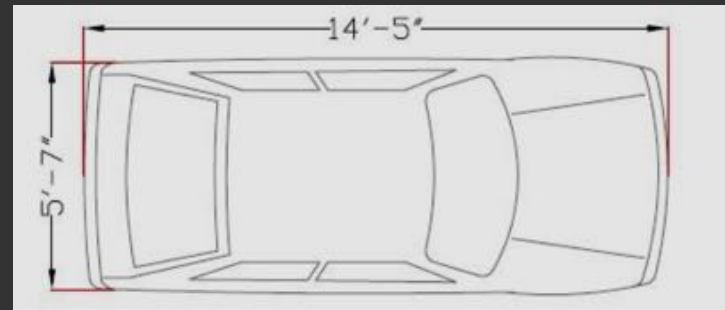
## An important challenge for the Industry:

- retain MC essential characteristics
- while delivering emissions reduction

# Why Motor Scooters



vs.



- Reduce Congestion
- Less Threat to Pedestrians and Cyclists (safer)
- Better Fuel Efficiency
- Less CO2 Emissions per mile
- Less Noise Pollution

## A motor scooter is not a motorcycle

- All manufacturer produced motorcycles and scooters must meet state noise emission limits
- Scooterists are commuters by nature and are unlikely to add performance enhancing components to their vehicles. Top cases, helmets, and chrome kits are the most popular accessories.
- Some motorcyclists add performance-related components (exhaust systems) to increase power which in turn increases noise. This is more common in the **motorcycle culture**.
- Noise emission from scooters will continue to meet state limits

# Noise Pollution: Purpose



To determine if a modal shift from four-wheeled vehicles to two-wheeled vehicles (scooters in particular) will impact noise pollution in New York City

The single biggest complaint to NYC 311 is NOISE



# Methodology



- Test noise emission (dB) of various Piaggio Group scooters and motorcycles using noise meters
  - 50cc scooter (Piaggio & Vespa)
  - 150cc scooter (Vespa)
  - 250cc scooter (Vespa & Piaggio)
  - 500cc scooter (Piaggio)
- Conducted at factory in Italy and accepted by EPA
- 4 Pass-by tests – calculated maximum dB is average of 4 tests collected from right and left sides of vehicle

# Results



<b>Piaggio Group Noise Emissions</b>	
	<b>Dynamic Test (DB)</b>
<b>50cc scooter (Piaggio Fly50)</b>	<b>68.45</b>
<b>50cc scooter (Vespa LX50)</b>	<b>69</b>
<b>150cc scooter (Vespa LX150)</b>	<b>72</b>
<b>500cc scooter (Piaggio X9)</b>	<b>74.3</b>
<b>500cc scooter (Piaggio BV500)</b>	<b>73.2</b>
<b>Honda Civic 2007 MY (30mph)</b>	<b>69</b>
<b>EPA Standard (Motorcycles)</b>	<b>80.0</b>
<b>NY State Regulation (Cars: 35-39ft)</b>	<b>91.0</b>
<b>NY State Regulation (Cars: 43-48ft)</b>	<b>89.0</b>
<b>Midtown Manhattan Traffic</b>	<b>70-85</b>

**NYC's new noise code prohibits "excessive sound from the muffler or exhaust of motor vehicles". "Excessive sound is defined as sounds that is: plainly audible at a distance of 150 feet or more from vehicles of less than 10,000 lbs; plainly audible at distance of 200 feet or more from vehicles of more than 10,000 lbs; e.g., trucks; plainly audible at a distance of 200 feet from a motorcycle."**

A grayscale background image of a motorcyclist wearing a helmet and riding a scooter on a road. The image is faded to allow the text to be the primary focus.

# Recommended Scooter Programs for New York City

# Scooter Friendly Programs



- Amended Congestion Pricing Program (if any)
- 7-1 Parking Program
- Municipal Pricing Programs
- Park & Ride Program
- Managed Lane Use Program
- Share the Road Program

# Congestion Pricing

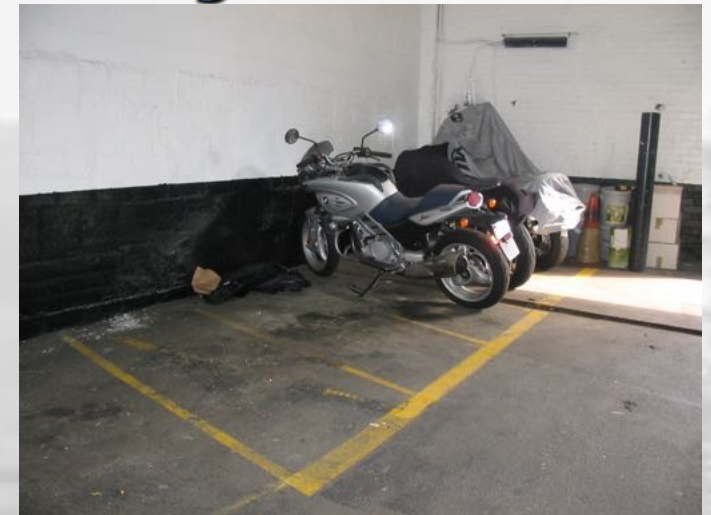


- Discount or no charge for 2 wheel vehicles entering restricted zones
- In London, UK motorcycles of a certain size receive a 100% discount on congestion charges
  - Riders have motorcycles inspected for size requirement (width = 3.3ft (1m) , length = 6.6ft (2m))
  - Submit registration confirming ownership
  - Discount lasts for 1 year and is renewable

# 7-1 Program

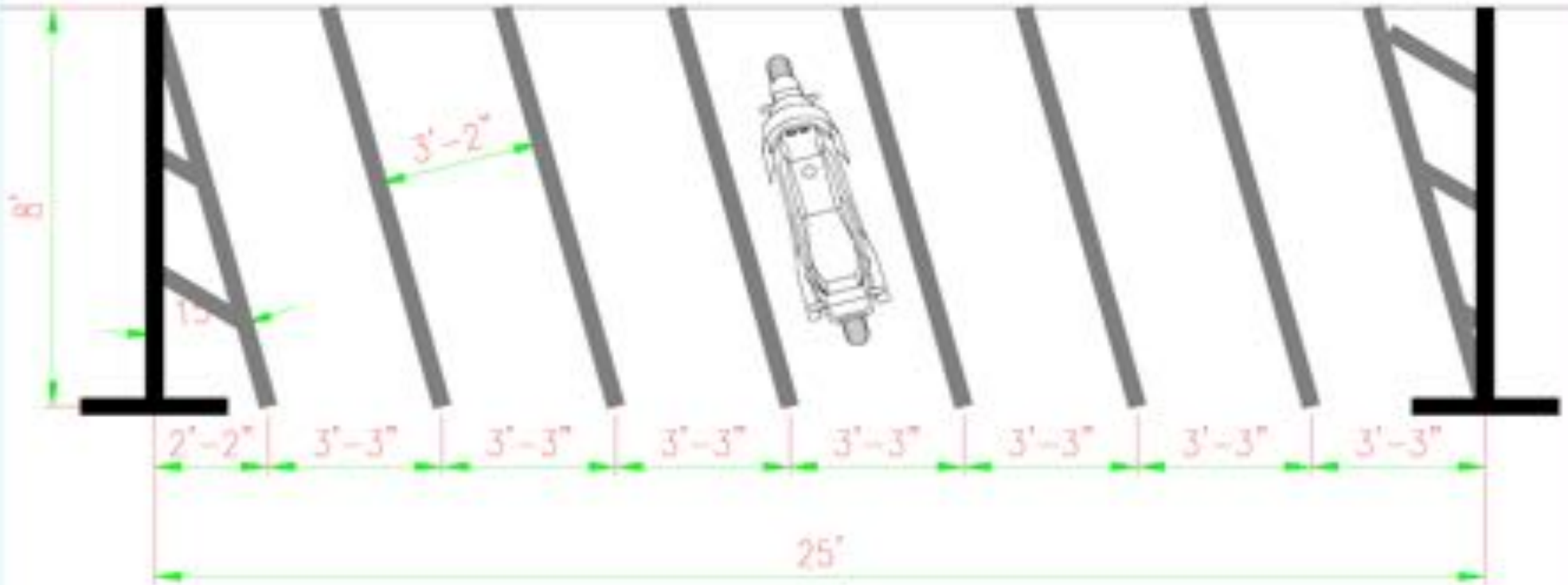


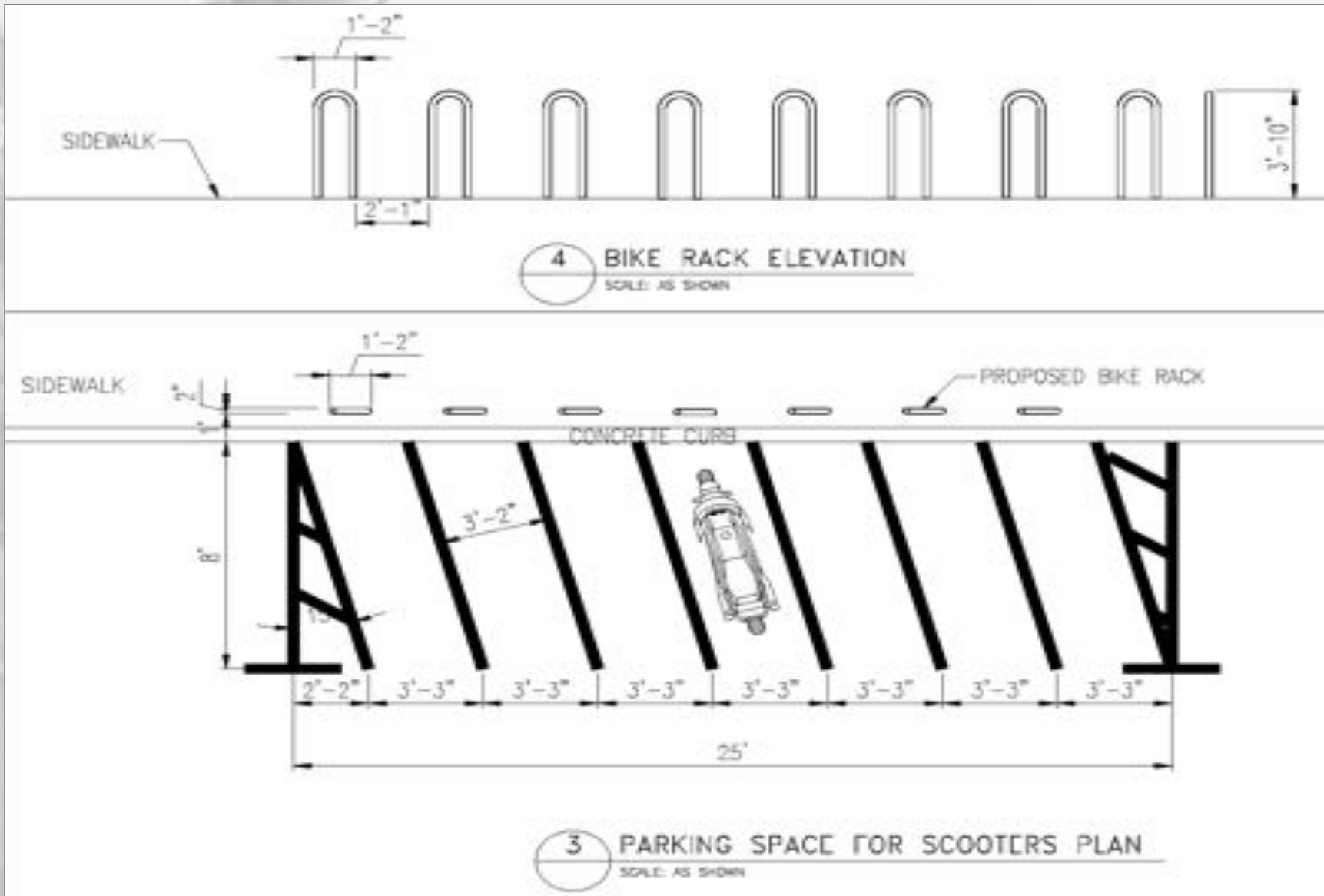
- Convert 1 four-wheeled vehicle parallel parking space into diagonal parking for 7 two-wheeled vehicles
  - 100 4-wheeled spots = 700 two-wheeled spots
- For ease of access spaces should be located at the corner of a block or in areas where vehicular parking is impractical



# 7-1 Program

CONCRETE CURB



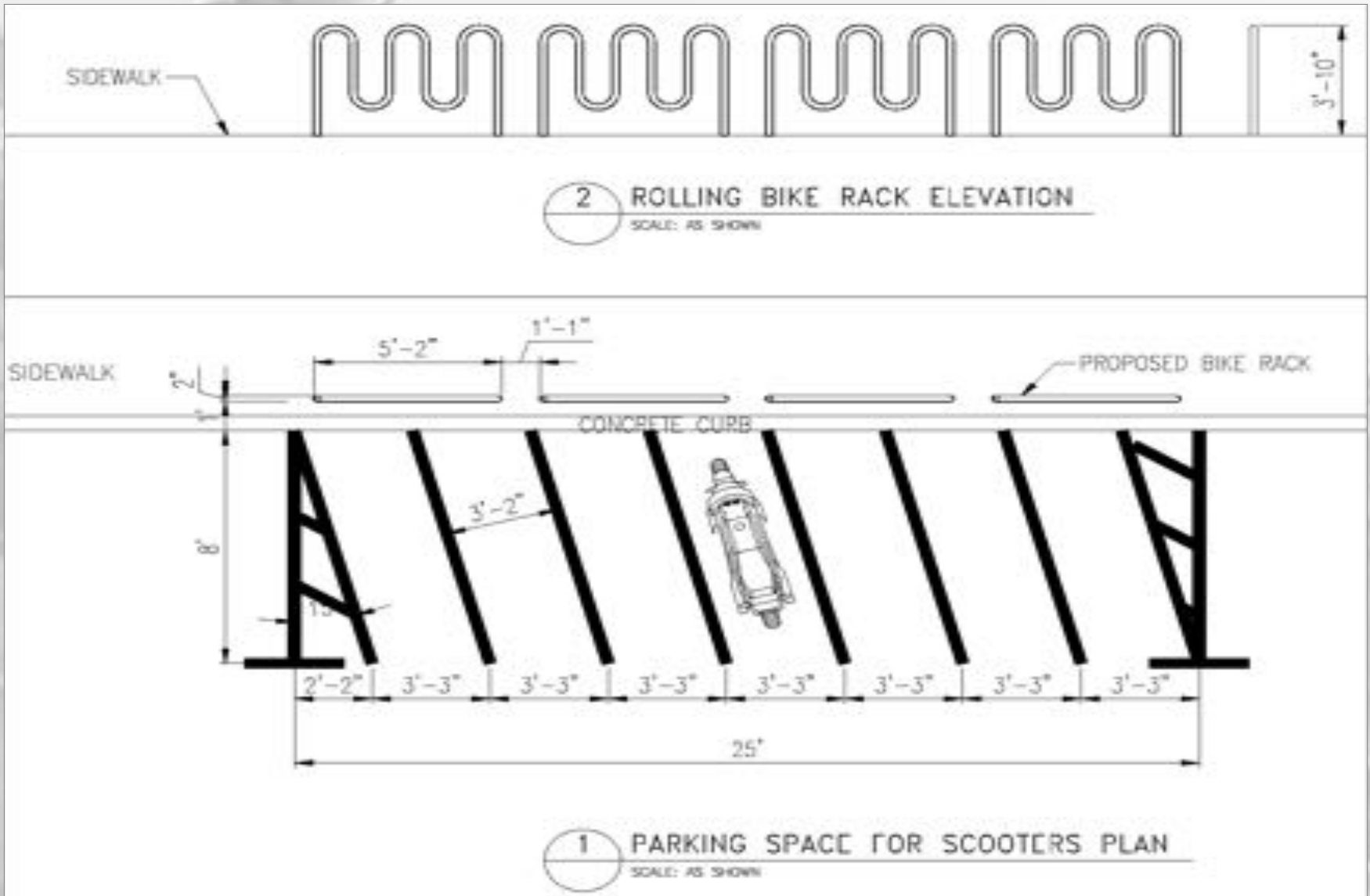




# 7-1 Program



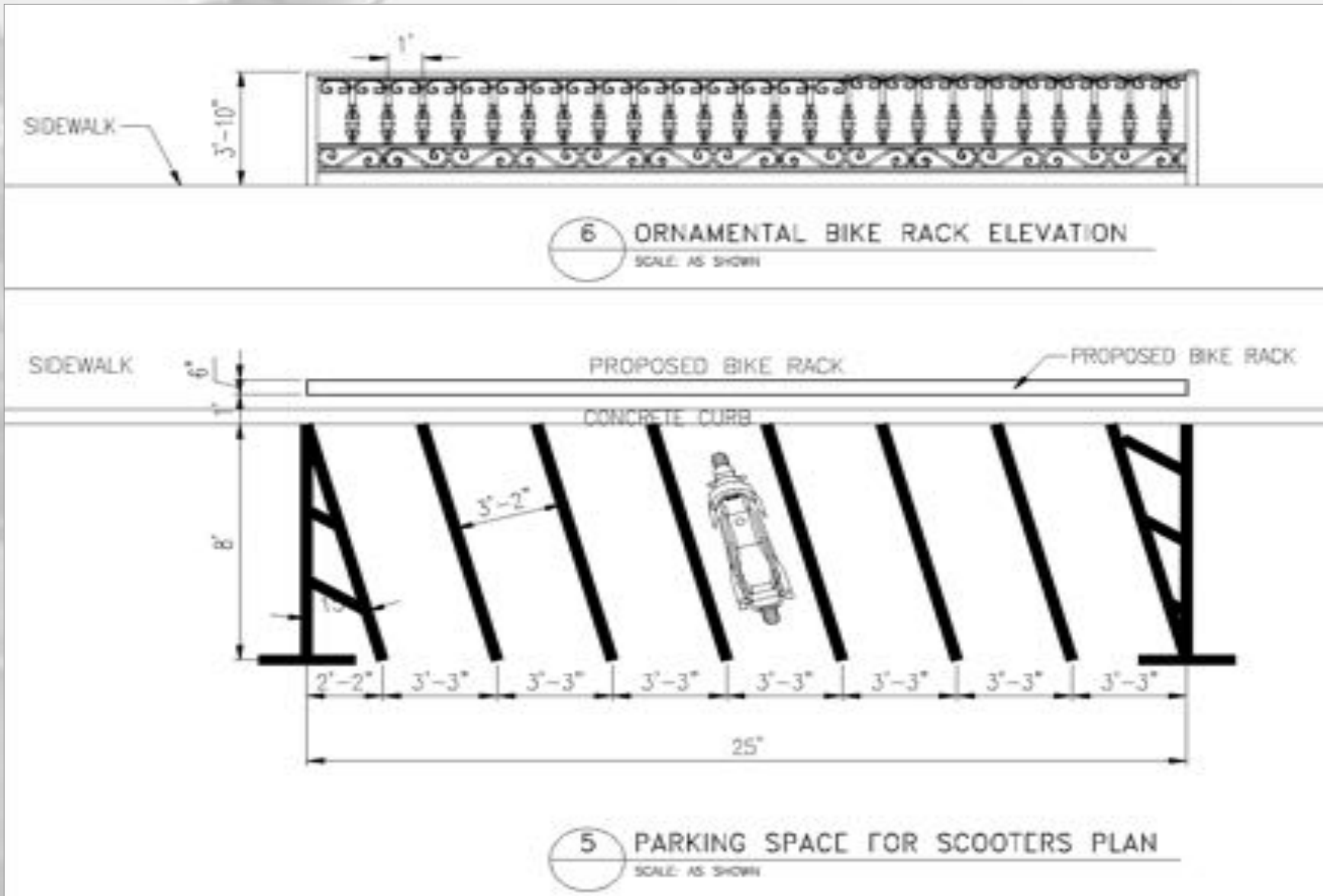
# 7-1 Program



# 7-1 Program



## 7-1 Program



# Municipal Pricing Program



- Municipal owned lots and garages can charge 75% less for 2-wheeled vehicles and still have 50% more revenues for equivalent space
  - 1 vehicle spot = at least 7 scooter spots, thus the city would actually make more money on the program
- Spaces should be easily accessible like spaces reserved for hybrids and smart cars



# Edison Parking - NYC



- Piaggio Group purchased 2 spaces in each of 4 Edison Parking garages in New York City in July-August 2007.
- Spaces were full every day.
- Several NYC papers picked up the story



The New York Times

*For Those on Two Wheels, a Little Piece of New York Heaven*



# Park and Ride Program



## PLANYC compatible

Areas where parking already exists for mass transit options (i.e. bus, train, ferry) – convert 2 spaces to 2-wheeled parking

- 14 spaces for the area of 2
- Charge 25% of vehicle price

### Examples

- Staten Island Ferry Terminal
  - 902 Spaces Currently
- Flushing #1 Municipal Lot - Near #7 line at Shea Stadium
  - 1101 spaces
- Queens Borough Plaza
- MetroTech, Brooklyn
- Bronx Borough Hall

# Park and Ride Facilities



- Parking lots and garages can charge 75% less for 2-wheeled vehicles



- Spaces should be easily accessible like spaces reserved for hybrids and smart cars

# Managed Lane Use Programs



- Possible special lane usage for scooters
  - Intra-City Bus Lanes
  - Intra-City HOV Lanes
- Lane splitting (see California regulations)





# Share the Road Program

- Scooter-specific “Share the Road” signage similar to programs for cyclists
- Variable Message Signs (VMS)



SHARE THE ROAD  
WITH BIKES &  
MOTOR SCOOTERS

# Share the Road Program



- Targeted educational brochures for various vehicle operators and pedestrians

**Professional Drivers:  
Please Help Us**

**SHARE  
THE ROAD  
SAFELY**

**AS A PROFESSIONAL DRIVER**, you may have millions of miles of safe driving experience. Often you may think you are sharing the road with 4-wheel vehicle drivers who seem to have no driving experience at all.

In too many cases, you may be right! Many commercial motor vehicle crashes occur due to errors in judgment by passenger car drivers operating around large trucks and buses. Unfortunately, when these crashes occur they reflect poorly on the motor carrier industry regardless of who caused the collision. We need to improve this situation together.

**F M C S A**  
Federal Motor Carrier Safety Administration

400 7th Street, S.W.  
Washington, D.C. 20590

[www.sharetheroadsafely.org](http://www.sharetheroadsafely.org)  
[www.fmcsa.dot.gov](http://www.fmcsa.dot.gov)

OCT 06 - 04 088      Revised 01/2013

U.S. Department of Transportation  
Federal Motor Carrier Safety Administration

# Motor Scooters Will Make Your Cities even More Fun and Cool!



## 50 MOST POWERFUL WOMEN

# Meg Rules!

(again)

No change at the top this year, but a rising tide of talent brings in a dozen fresh faces.

BY JIA LYNN YANG AND EUGENIA LEVENSON

### 1

**MEG WHITMAN**  
Chairman and CEO  
eBay  
2004 rank: 1 | Age: 42

The empress of eBay still rules Silicon Valley. Though the stock has had a rough year, down about 30%, revenues and profits are strong. To keep eBay expanding—it now has 68 million active users—Whitman has gone shopping, buying seven new businesses for more than \$1.3 billion. Up next: the controversial \$2.6 billion acquisition of Super.com. See the booklet later in this package for Whitman's take on the deal.

Turn this page and open the foldout to see the list. →

PHOTOGRAPH BY ROBIN THOMAS

November 14, 2005 FORTUNE • 121

A grayscale photograph of a motorcyclist riding a scooter on a road. The rider is wearing a helmet and a jacket. The background shows a road with lane markings and hills in the distance. The word 'Appendix' is overlaid in the center in a blue, sans-serif font.

# Appendix

# NY Noise Emission Regulations



Table 1 Maximum Permissible Sound Level Readings [Decibel (A)] <sup>1,2</sup>

If the distance between the microphone location and the microphone target point is	Highway operations test				Stationary tests	
	Soft site		Hard site			
	35 mi/h or less	Above 35 mi/h	35 mi/h or less	Above 35 mi/h	Soft site	Hard site
35 ft. (10.7 m) or more but less than 39 ft. (11.9 m)	89	93	91	95	89	91
39 ft. (11.9 m) or more but less than 43 ft. (13.1 m)	88	92	90	94	88	90
43 ft. (13.1 m) or more but less than 48 ft. (11.6 m)	87	91	89	93	87	89
48 ft. (14.6 m) or more but less than 58 ft. (17.1 m)	86	90	88	92	86	88
58 ft. (17.1 m) or more but less than 70 ft. (21.3 m)	85	89	87	91	85	87
70 ft. (21.3 m) or more but less than 83 ft. (25.3 m)	84	88	86	90	84	86

# Scooter Savings



Yearly Fuel Costs	
Vespa Scooter	\$573
Average Car	\$1,447
Savings	\$847

	Premium policy	Premium All-cover policy
Vespa Scooter	\$152	\$270
Average Car	\$735	\$825
SUV	\$792	\$893
Savings vs. Car	\$583	\$555
Savings vs. SUV	\$640	\$603

# 7-1 Program

