

TRT TRASPORTI E TERRITORIO SRL

Low emission zones for transport in the Benelux?  
BIVEC – GIBET  
Leuven Faculty Club, 28 March 2012

# Milano, from pollution charge to congestion charge

Angelo Martino  
TRT Trasporti e Territorio

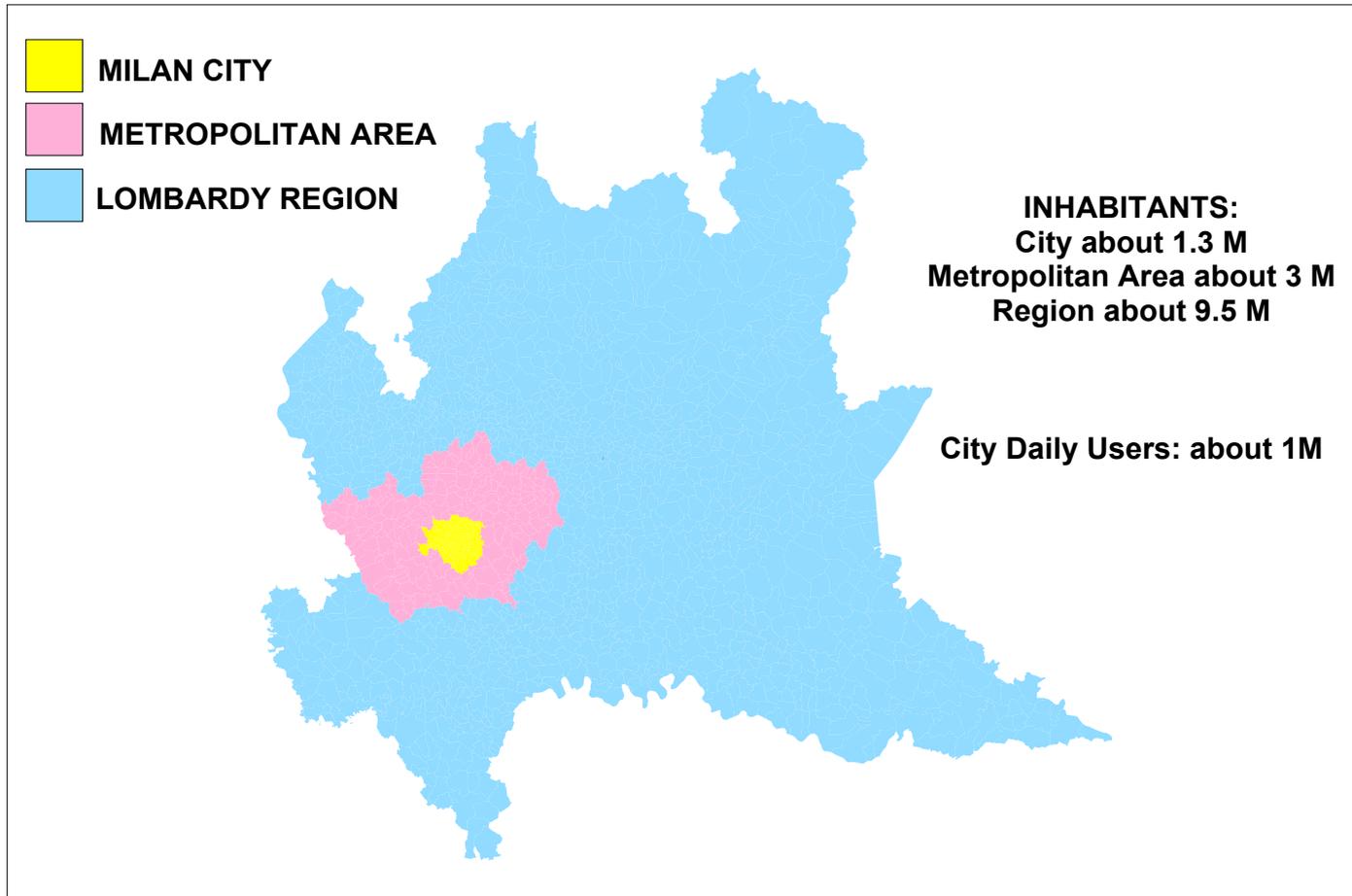


# Content of the presentation

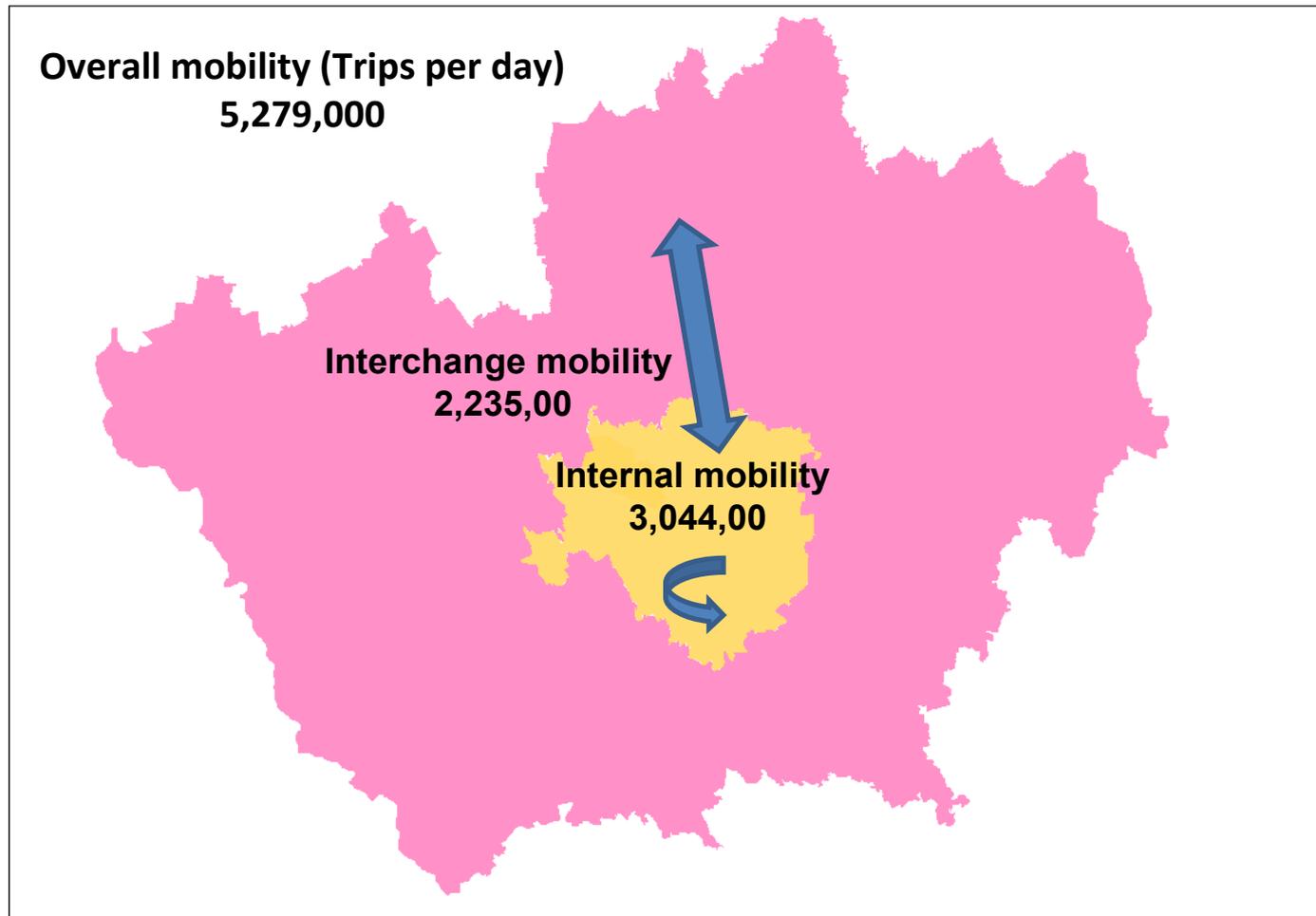
- **Mobility in Milan**
- **Ecopass system (2008-2011)**
- **AreaC system (2012-2013)**



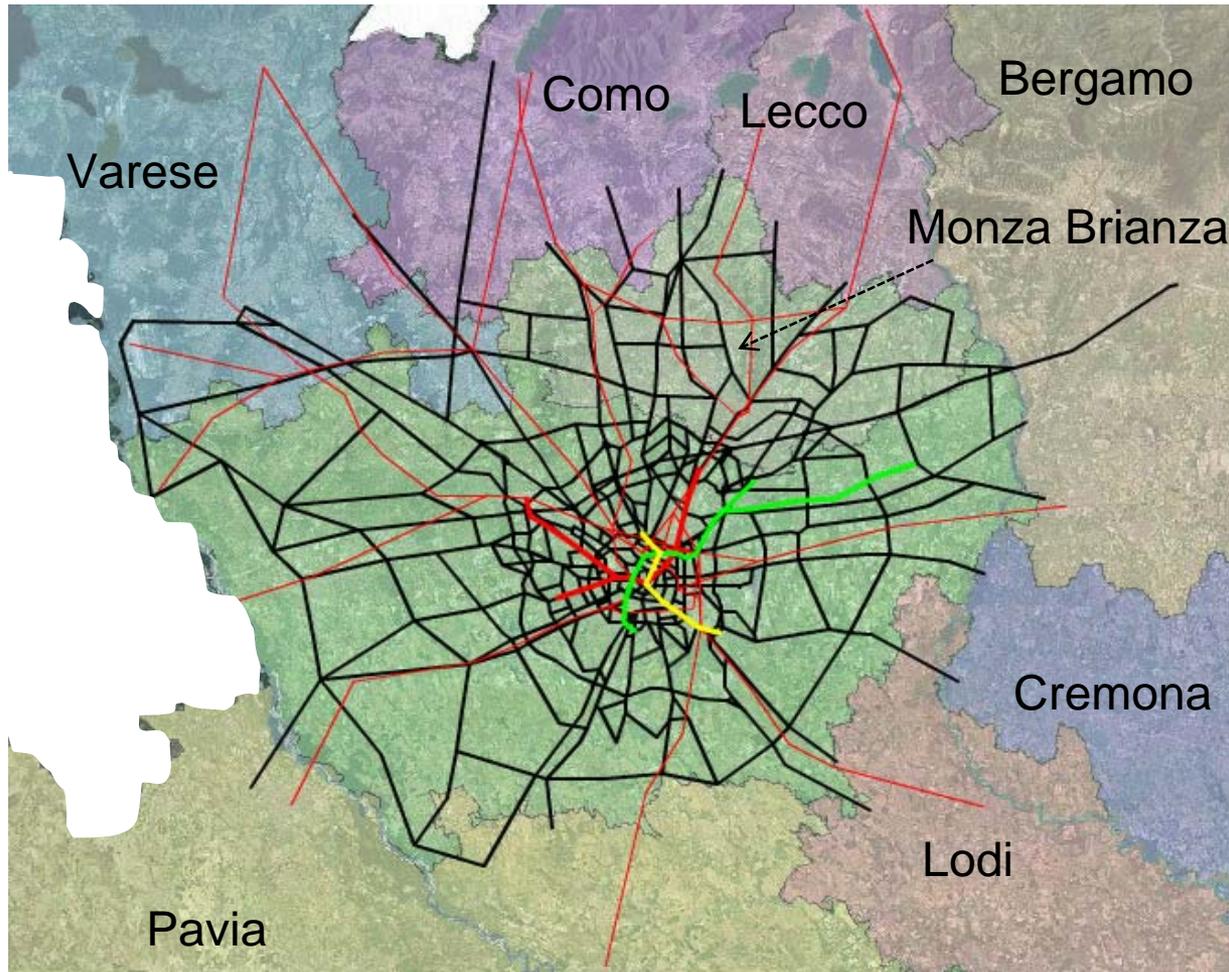
# Milan, the metropolitan area and the region



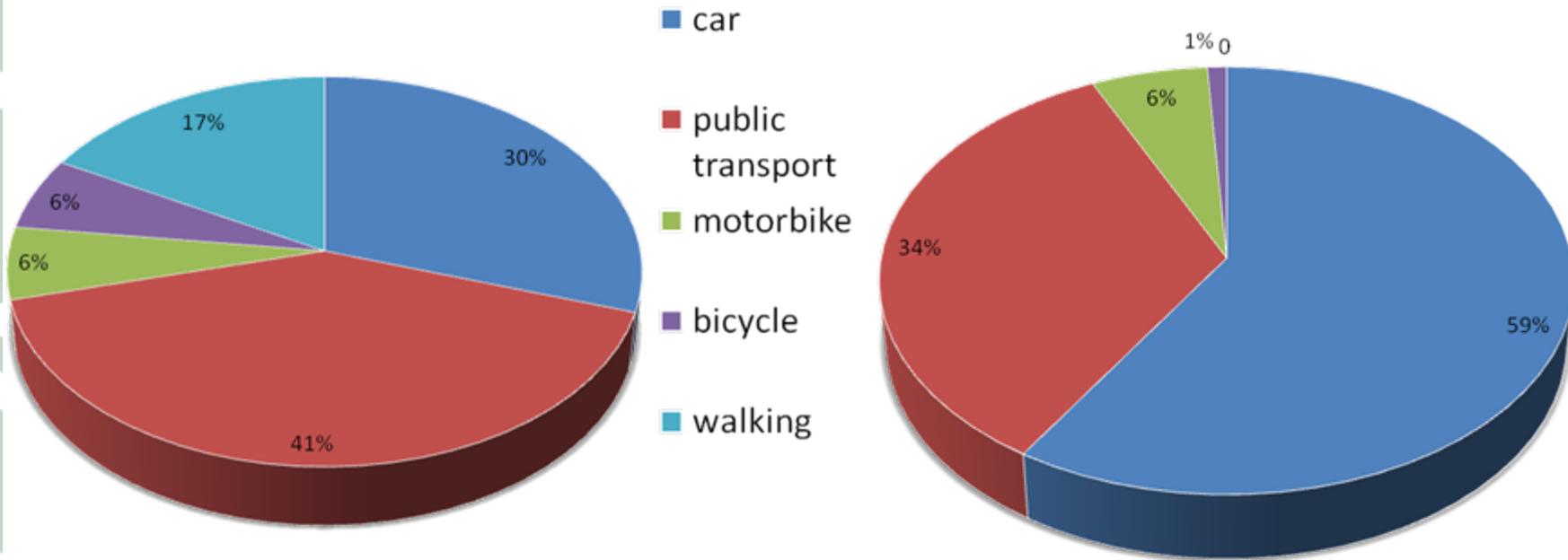
# Milan and the metropolitan area



# Metropolitan Area Transport Network



# Milan: modal split



**Internal trips**

**Interchange trips**

**2,220,000 trips by car per day**

**230,000 trips entries in the central ring  
(2007 - before Ecopass - 7 to 9 am)**

# The ECOPASS system



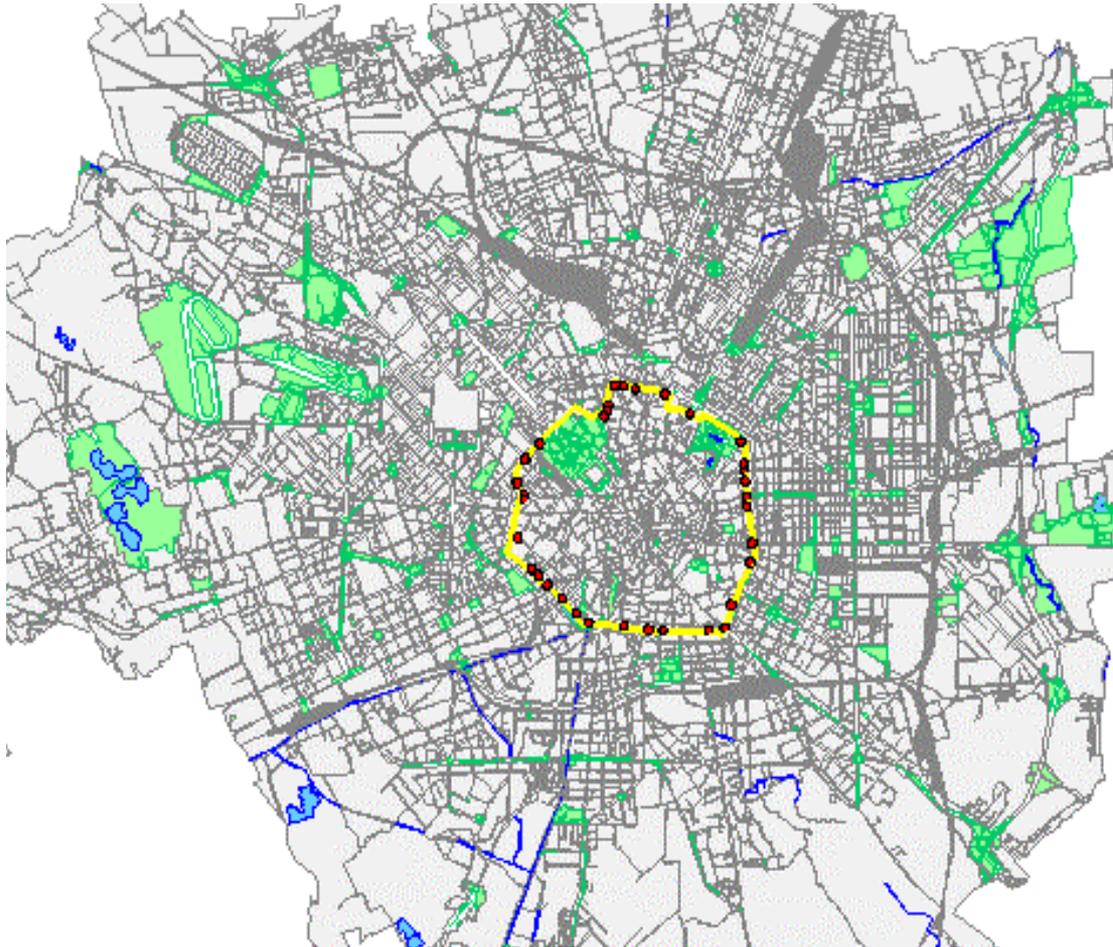
- **ECOPASS** started operating on 2 January 2008 in the Milan central city ring zone known as “Cerchia dei Bastioni”
- **ECOPASS** is a Limited Traffic Zone (LTZ) scheme: vehicles are charged to enter the area and the fee structure is based on the vehicles' emission standards.

## Objectives

- ✓ reduce road congestion within the urban area
- ✓ improve transport safety across the modes
- ✓ improve public transport service quality
- ✓ introduce technical innovation
- ✓ improve air quality
- ✓ improve urban freight distribution



# ECOPASS charging area «cerchia dei Bastioni»



## AREA

- 8.2 Km<sup>2</sup> (4.5%)
- 77,000 residents (6%)
- 43 entry points

## OPERATING TIMES

- Weekdays from 7.30 am to 7.30 pm

# Ecopass pollution classes



POLLUTION CLASS	VEHICLE EURO CATEGORY	DAILY ECOPASS
Class 1	gpl - methane - elettrico – hybrid	FREE
Class 2	Euro 3, 4 and 5 petrol cars and goods vehicles Euro 4 and 5 diesel cars Goods vehicles with diesel particulate filter	FREE
Class 3	Euro 1, 2 petrol cars and goods vehicles	2 €
Class 4	pre-Euro petrol cars and goods vehicles Euro 1, 2 and 3 diesel cars Euro 5, 4 and 3 diesel goods vehicles Euro 4 and 5 diesel buses	5€
Class 5	pre-Euro diesel cars pre-Euro, Euro 1 and 2 diesel goods vehicles	10€



# Ecopass payment systems

**Ecopass entry tickets could be activated:**

- ✓ cash
- ✓ credit card
- ✓ internet



# Ecopass enforcement



## ANPR

Automatic Number Plate Recognition



# ECOPASS impact



## Year 2010 compared to year 2007

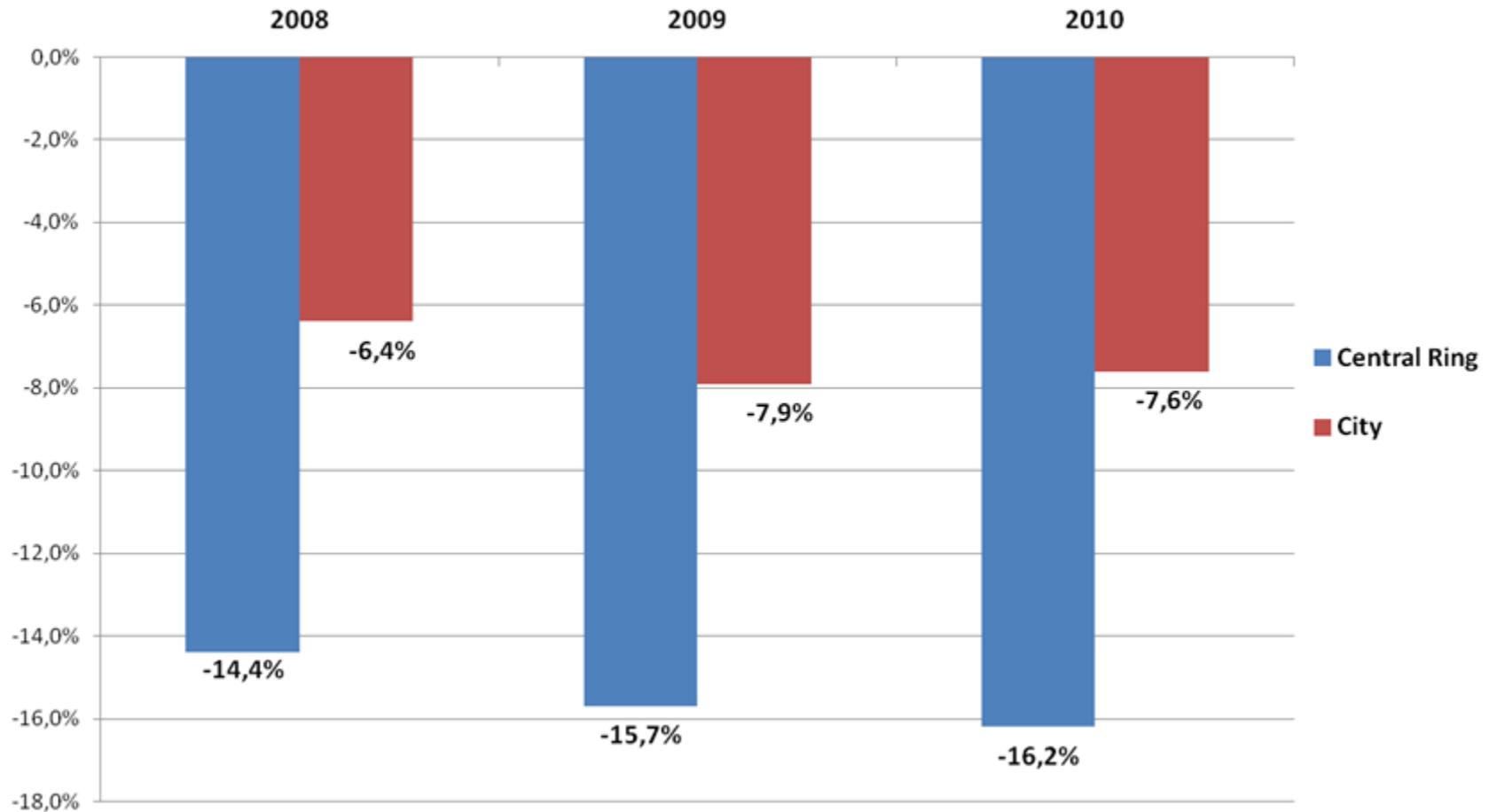
- ✓ Commercial and private traffic during ECOPASS hours - **16.2%**
- ✓ Polluting vehicles (fee-paying classes) - **67.9%**
- ✓ Accidents - **12.8%**
- ✓ Public transport operating speed + **7.9%**
- ✓ Public transport passengers + **8.1 %**
- ✓ Daily average emissions of pollutants in the ECOPASS area:
  - Total PM10 - **15%**
  - Exhaust PM10 - **25%**



# ECOPASS impact on traffic



## Car trips entering the Ecopass area



# ECOPASS impact on vehicle fleet



## Vehicles' categories entering the ECOPASS Area

Private	November 2007	February 2008	June 2011
<b>Class 1</b>	1,3%	2,6%	9,0%
<b>Class 2</b>	60,0%	77,3%	76,5%
<b>Class 3</b>	14,0%	8,9%	3,5%
<b>Class 4</b>	24,7%	11,2%	10,9%
<b>Class 5</b>	0,0%	0,0%	0,0%
<b>Paying classes</b>	<b>38,7%</b>	<b>20,1%</b>	<b>14,4%</b>
Commercial	November 2007	February 2008	June 2011
<b>Class 1</b>	0,7%	3,6%	16,9%
<b>Class 2</b>	25,8%	39,3%	47,3%
<b>Class 3</b>	2,7%	2,4%	1,4%
<b>Class 4</b>	50,5%	41,4%	30,2%
<b>Class 5</b>	20,3%	13,2%	4,3%
<b>Paying classes</b>	<b>73,5%</b>	<b>57,0%</b>	<b>35,8%</b>



# ECOPASS costs and revenues



	2008	2009	2010
Operation costs (M€)	6.5	n.a.	n.a.
Revenues (M€)	12.5	9.6	8.9
Fines (average n./day)	2960	1960	n.a.
	≈2.6% of total entries	≈2% of total entries	

**Although no precise data are available, revenues from fines were estimated to be higher than those from tickets payment**



# ECOPASS after 3 years



- ✓ Renewal of the private vehicle fleet
- ✓ Decreasing revenues from ECOPASS
- ✓ Negligeble impacts on air quality
- ✓ Need of additional resources for PT
- ✓ Pressure of environmentalists





## REFERENDUM CITTADINO CONSULTIVO DI INDIRIZZO

**“Volete voi che il Comune di Milano adotti e realizzi un piano di interventi per potenziare il trasporto pubblico e la mobilità “pulita” alternativa all’auto, attraverso l’estensione a tutti gli autoveicoli - esclusi quelli ad emissioni zero - e l’allargamento progressivo fino alla “cerchia ferroviaria” del sistema di accesso a pagamento, con l’obiettivo di dimezzare il traffico e le emissioni inquinanti?**

**In particolare gli interventi richiesti sono:**

- a. il raddoppio entro il 2012 dell’estensione delle aree pedonali, sia in centro che in periferia, comprendendo per lotti l’intera area della Cerchia dei Navigli a partire dal “Quadrilatero della moda”;
- b. il raddoppio entro il 2012 delle aree a traffico moderato - zone a 30 Km/h - e la realizzazione di interventi per la sicurezza stradale dei quartieri residenziali;
- c. la realizzazione entro il 2015 di una rete di piste ed itinerari ciclabili integrati e sicuri di almeno 300 km ed il raddoppio entro il 2012 degli stalli di sosta per le biciclette;
- d. la protezione e “preferenziazione” di tutte le linee di trasporto pubblico entro il 2015, in modo da aumentarne velocità e regolarità;
- e. l’introduzione in tutta la città, a partire dalle aree periferiche, di un servizio diffuso diurno e notturno di “bus di quartiere” in collegamento con le principali fermate del trasporto pubblico, senza costi aggiuntivi rispetto al titolo di viaggio;
- f. l’estensione sull’intero territorio cittadino del servizio di bike sharing, raggiungendo 10.000 bici entro il 2012 e del servizio di car sharing raggiungendo 1.000 auto elettriche entro il 2012;
- g. il prolungamento dell’orario di servizio delle linee metropolitane fino alle ore 1.30 tutte le notti;
- h. il potenziamento del servizio taxi mediante il ripristino del secondo turno che garantisca fino a 8 ore aggiuntive di servizio - “seconda guida” -;
- i. il ripristino del divieto di circolazione e carico e scarico merci nella Cerchia dei Bastioni nelle fasce orarie di picco del traffico mattutine e pomeridiane e la promozione di un sistema di trasporto condiviso con veicoli elettrici;
- j. l’estensione della regolamentazione della sosta in tutta l’area compresa all’interno della “cerchia filoviaria” e nelle aree circostanti gli assi delle metropolitane, con esclusione del pagamento dei soli residenti e per i veicoli ad emissioni zero;
- k. incentivi a sostegno del trasporto pubblico.”

**FAC - SIMILE**



**FAC - SIMILE**

**Question:**

*Would you like to extend the charged zone to the whole city and to all vehicles categories to fund policies for sustainable mobility?*

**Answers: 80% YES**

**20% NO**

**(Polling: 49%)**



# From pollution charge to congestion charge

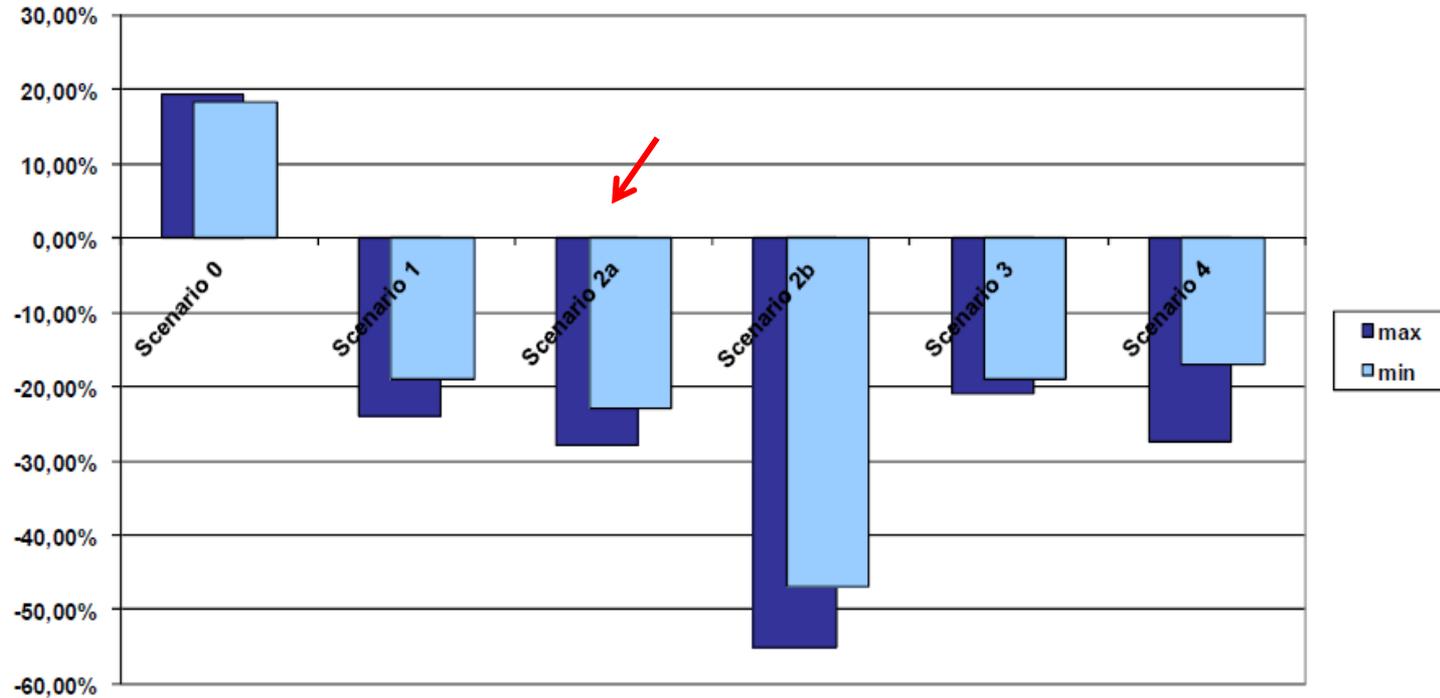
Spring 2011: administrative elections and new city government

SCENARIOS	VEHICLES	CHARGE
0 – Free	ALL	0 €
1 – Ecopass	As ECOPASS	ECOPASS scheme with increased charges
2a – Congestion Charge	ALL Electric and hybrid free	5 € 7.30 am - 7.30 pm
2b – Congestion Charge	ALL Electric and hybrid free	10 € 7.30 am - 7.30 pm
3 – Time dependent Congestion Charge	ALL Electric and hybrid free	6€ 7.30 am – 11.30 am 3€ 11.30 am – 7.30 pm
4 – Season dependent Congestion Charge	ALL Electric and hybrid free	6€ 15 October – 15 April 3€ 15 April – 15 October



# Estimated impact on traffic

Settore Pianificazione Mobilità Trasporti Ambienti  
Comune di Milano



Milano



Comune  
di Milano

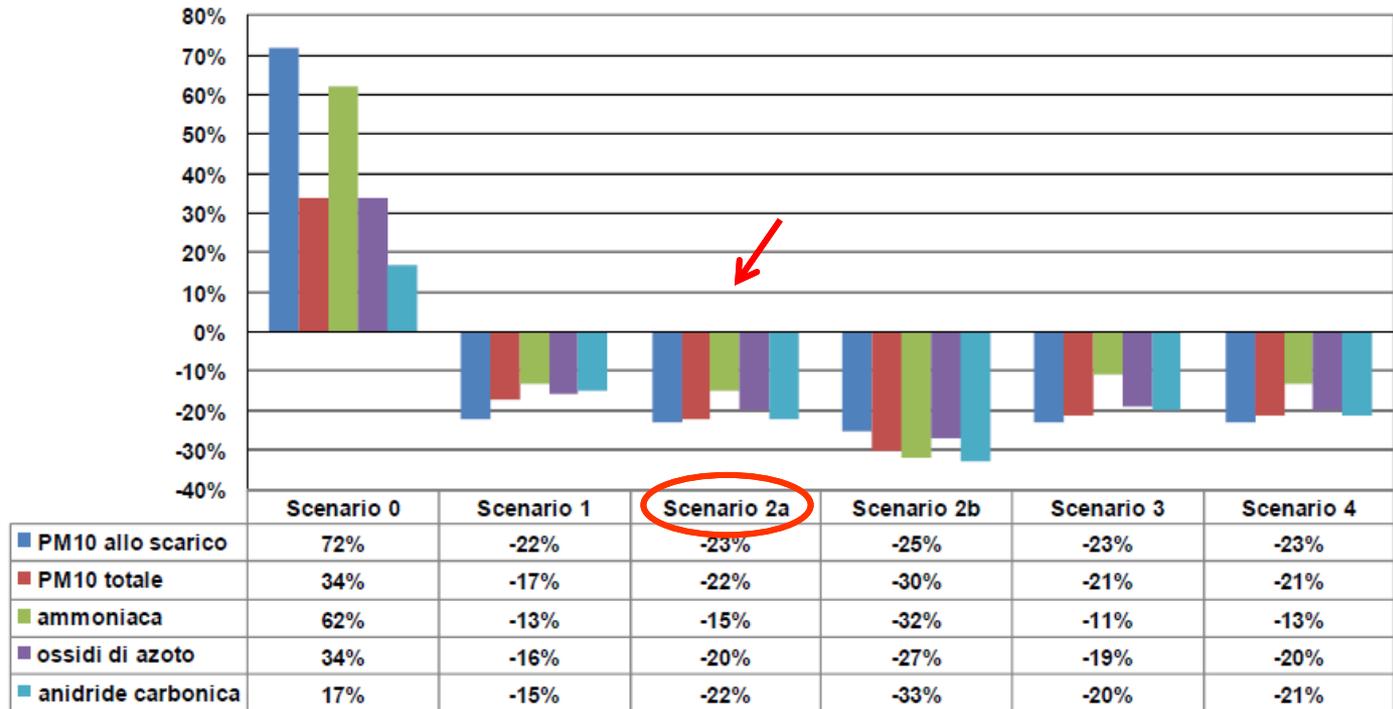


AGENZIA  
MOBILITÀ  
AMBIENTE  
TERRITORIO



# Estimated impact on emissions

Settore Pianificazione Mobilità Trasporti Ambienti  
Comune di Milano



Milano



Comune  
di Milano

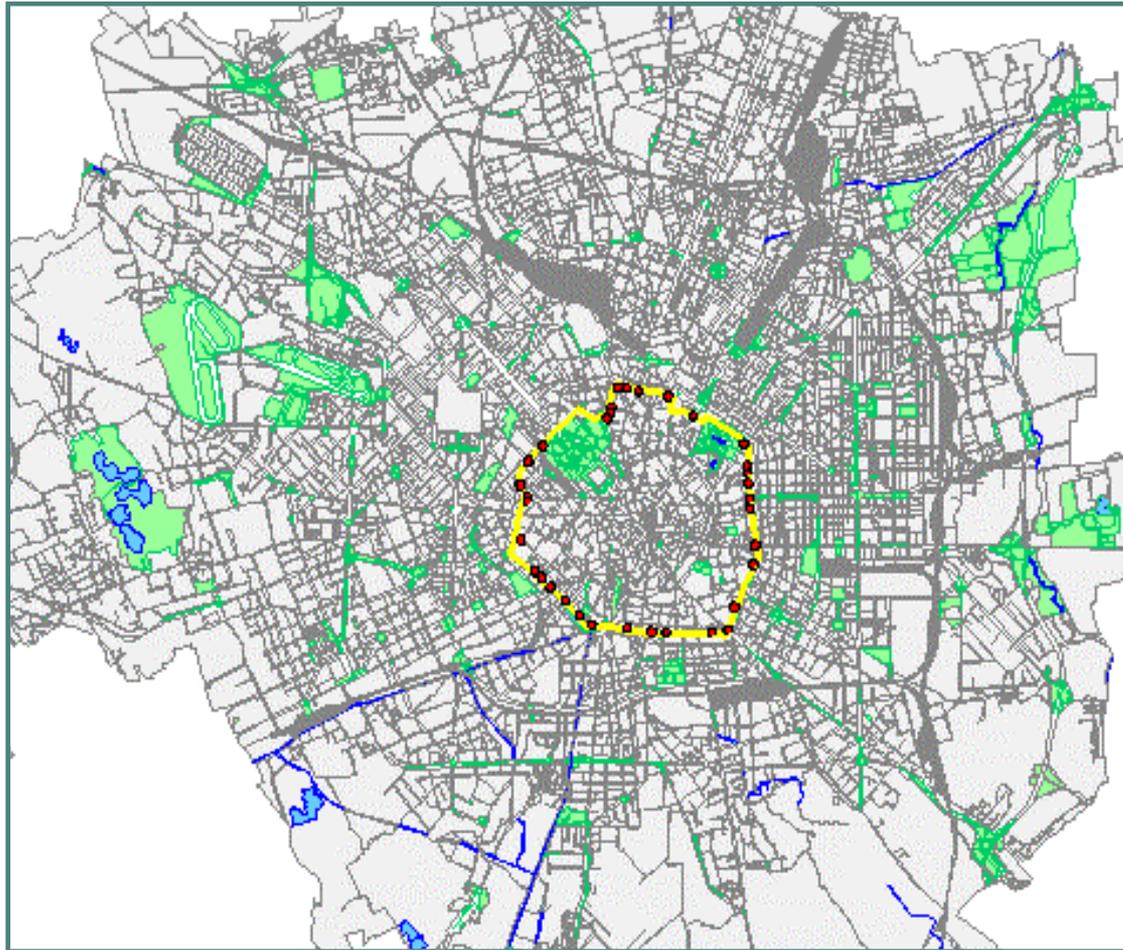


# The AreaC system



- **AreaC** started on **16 January 2012** and will be tested for **18 months**
- It is based on the same ECOPASS technology in the same area for the same time period
- For **residents** 40 free entrance are available and then any additional entrance will cost 2€
- For the first 6 months, **goods vehicles** can choose to pay 5€ including parking or 3€ + parking (parking cost in Milan central area is about 2€/h)

# AREA C charging area «cerchia dei Bastioni»



## AREA

- 8.2 Km<sup>2</sup> (4.5%)
- 77,000 residents (6%)
- 43 entry points



## OPERATING TIMES

**Weekdays from 7.30 am to  
7.30 pm**

# The AreaC system



AREA	Central Ring
TIME	7.30 am - 7.30 pm No charge on weekends and public holidays
CHARGE	5 € (the payment allows to travel the whole day in the charged area)
VEHICLES	All <ul style="list-style-type: none"><li>• free entrance for electric and hybrid</li><li>• entrance <b>forbidden</b> for gasoline pre-euro, diesel pre-euro, Euro I and II)</li></ul>

# AreaC - How to pay



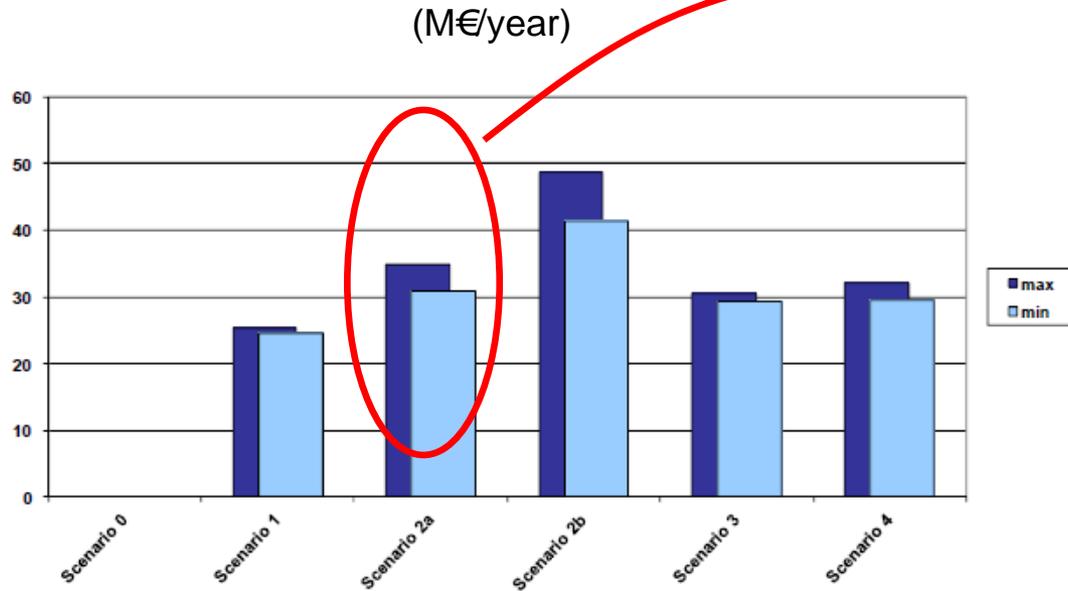
- ✓ Daily ticket or multiple tickets
- ✓ RID – permanent charging on bank account
- ✓ Internet (<https://areac.atm-mi.it/AreaC/iweb/Acquisto.aspx>)
- ✓ Call center Area C: 800.437.437
- ✓ Intesa San Paolo Bank ATMs
- ✓ Parking meters (with PagoBancomat, credit card or cash)



## With TELEPASS

- ✓ You can select the option from your reserved area on the website
- ✓ You don't need to have the TELEPASS on your vehicle (the system is based on plate's recognition)

# AreaC - Expected incomes



Revenues (31 – 35 M€/year) will be used to support **sustainable mobility** (public transport, walking , cycling) with precise targets for the city administration

# AreaC - The NO CHARGE commitee



**Central area shopkeepers, residents, parkings' owners and other associations** has been leading a strong campaign against Area C



All **petitions** have been **rejected** by the Lombardy Administrative Tribunal:  
“**Public Health** has to be cared, **prior to private interests.**”

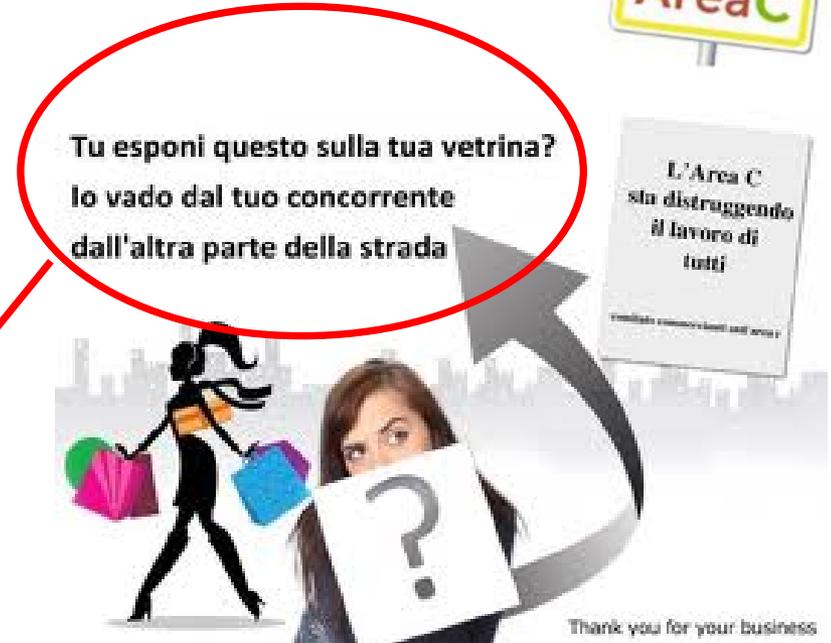
# AreaC - The supporters

**Shopkeepers favourable to AreaC reacted with a leaflet on facebook**



Do you post it on your window?

Ok, I'll go shopping on the opposite side of the road!



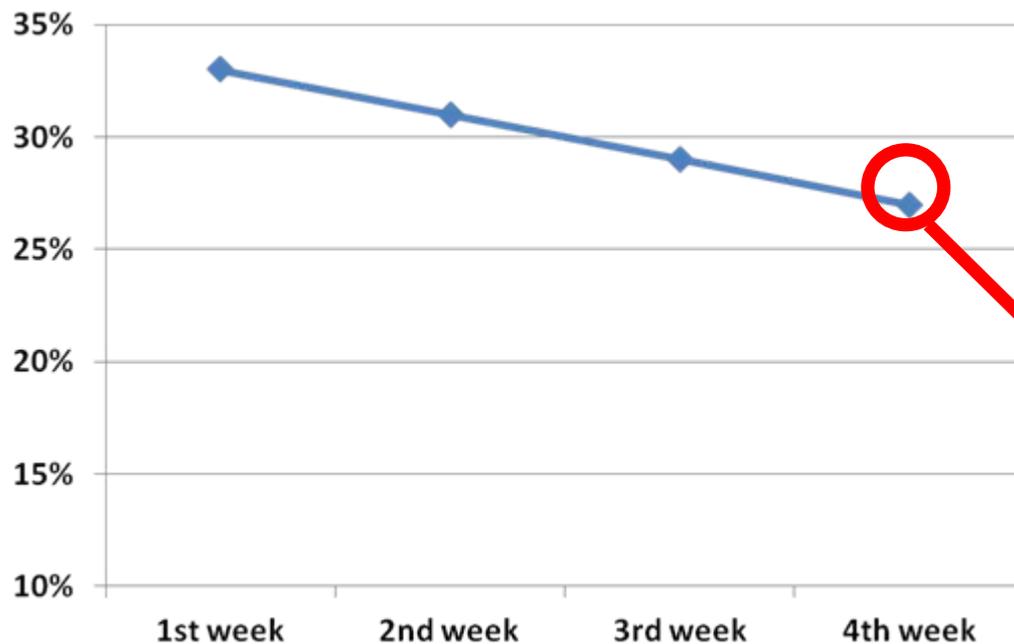
- ✓ Pro-environment associations
- ✓ Cyclists associations
- ✓ Green party
- ✓ etc.



**"We need it !"**



# 1 month of AreaC – Traffic volumes

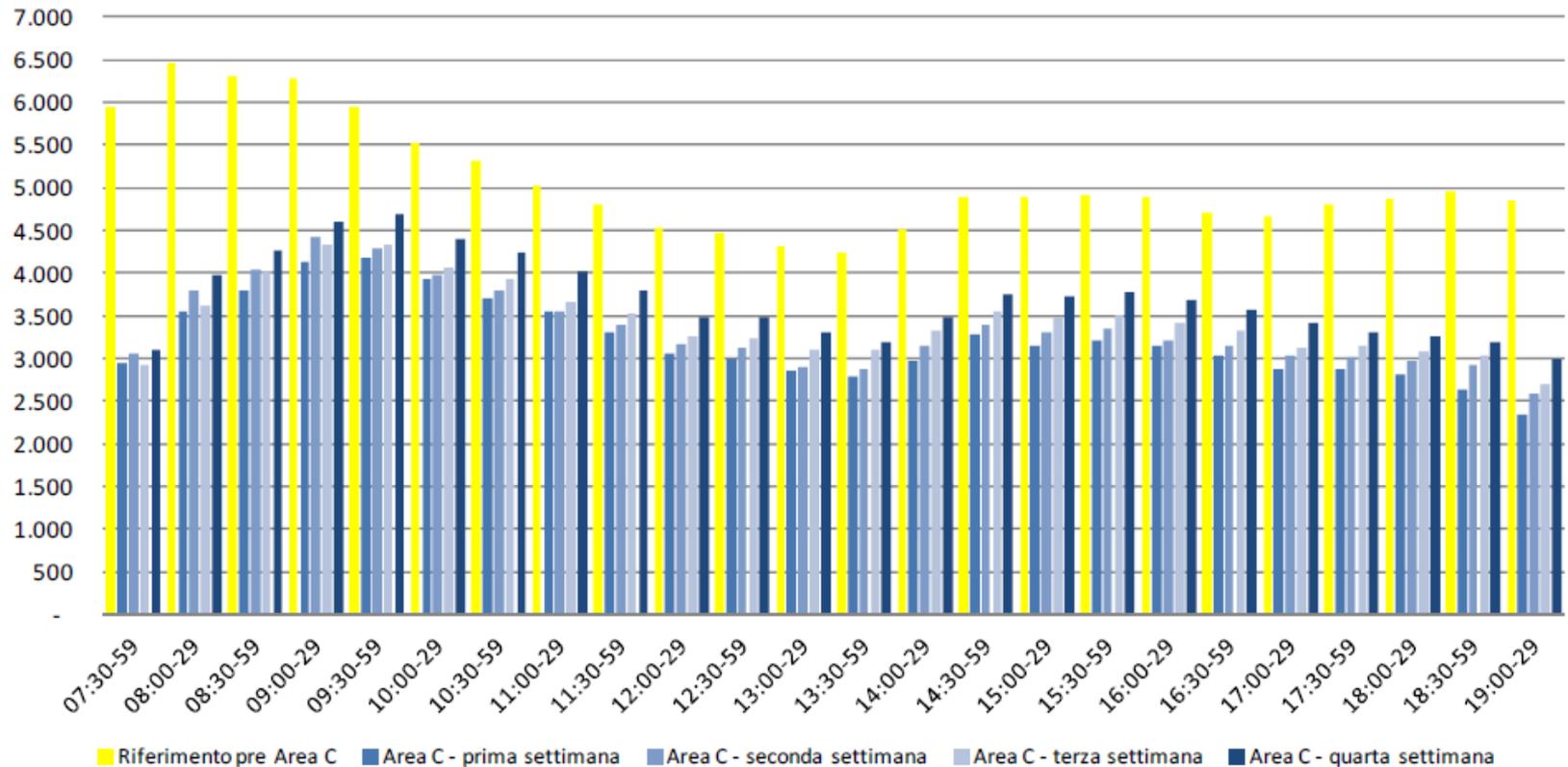


**average on 1 month:**  
**- 33%**  
( $\approx$  40.000 vehicles less)

**4<sup>th</sup> week: - 27%**

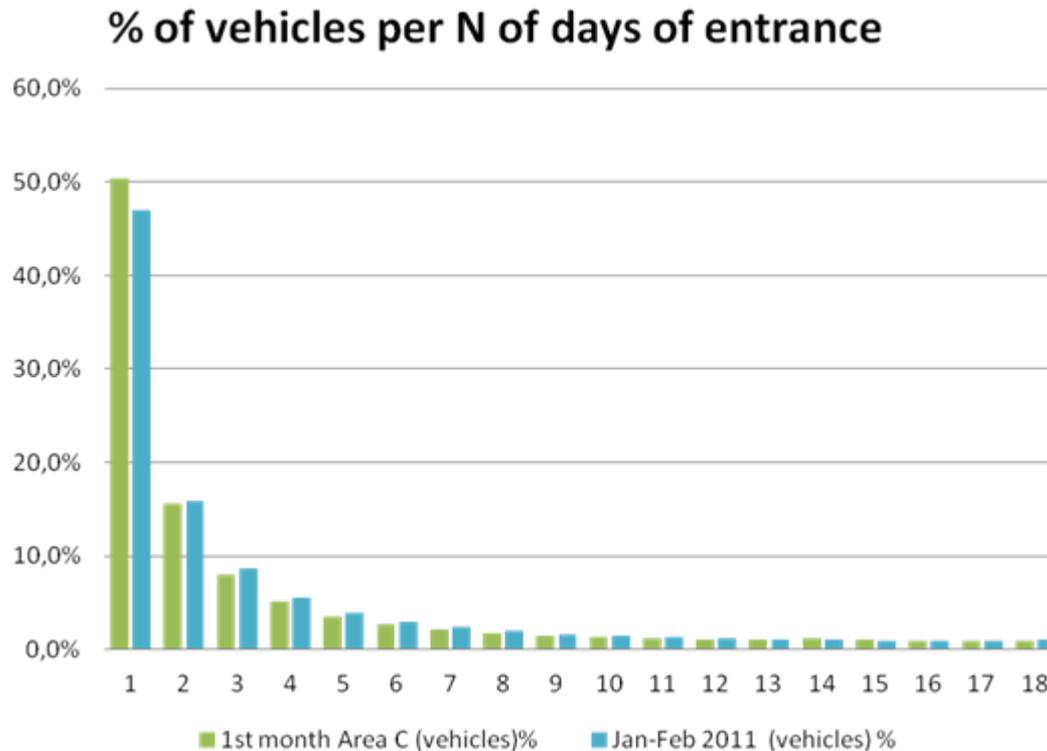
in line with  
expected data  
(-23% up to - 28%)

# 1 month of AreaC – Hourly traffic distribution



**- 45% entrances during peak times  
7.30am - 9.30am / 5.30pm - 7.30pm**

# 1 month of AreaC – Entrance frequency



Only **3,5%** are **systematic trips**  
(n. of entrances  $\geq 15$  on 18)



More than **70%** are **occasional trips**  
(with n. of entrances  $\geq 1$  and  $\leq 3$ )

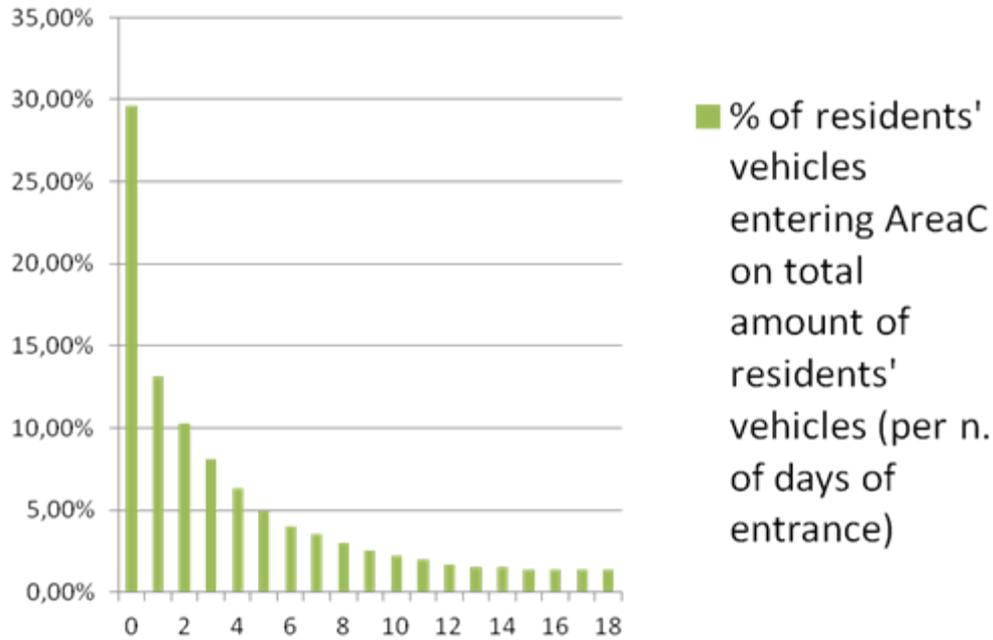
The comparison is made between:

- 18 days in the 1<sup>o</sup> month - (January 2012);
- 18 days in January 2011

# 1 month of AreaC – Entrance frequency of residents' vehicles



Residents' vehicles entrance frequency\*



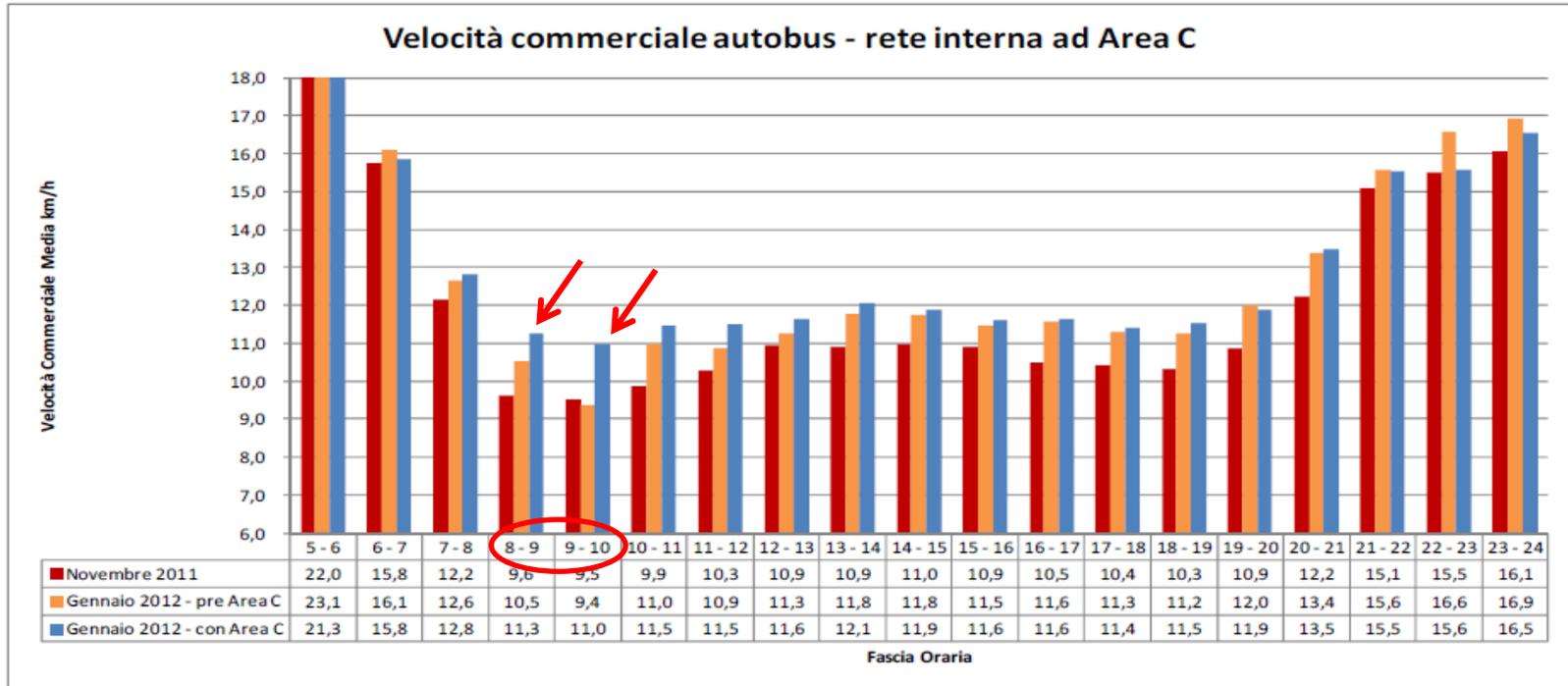
\*First 18 days in the 1<sup>o</sup> month (January 2012)

✓ Almost **30%** of vehicles has never entered the AREAC in the first 18 days.

✓ **1/3** of those that has entered, has done it **< 3 times**

✓ Only **5%** can be considered **systematic** (n. of entrances  $\geq 15$  on 18)

# 1 month of AreaC – PT (bus) speed



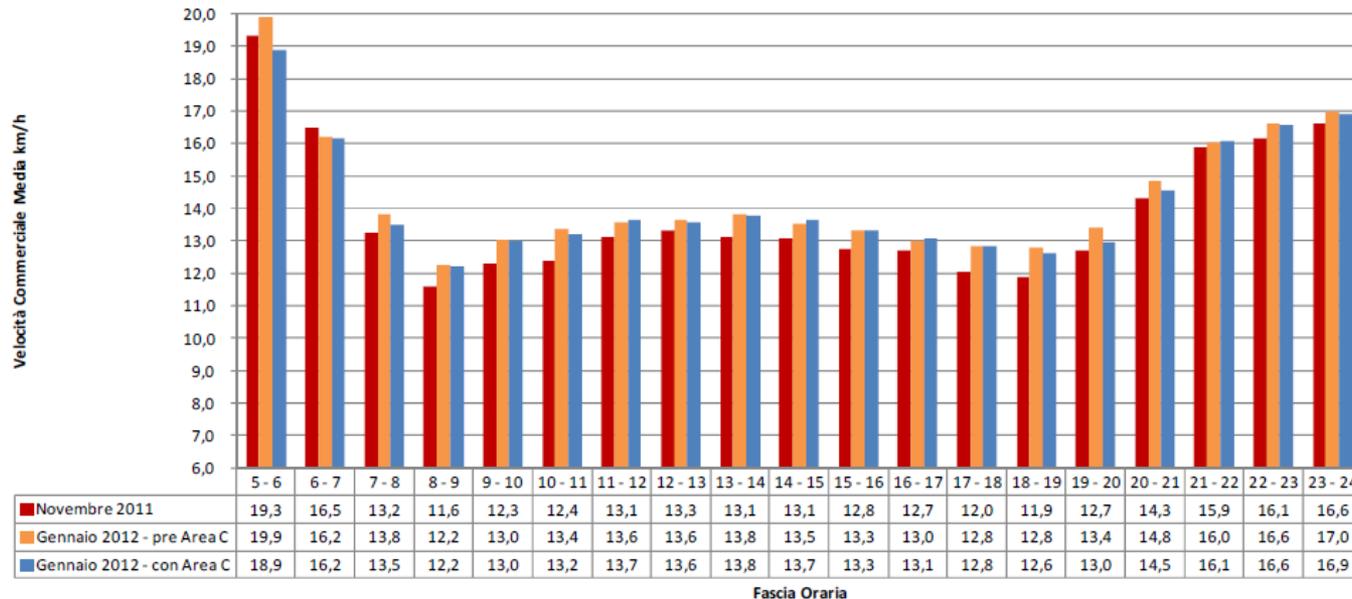
**Commercial speed has increased** (compared to an average week of November 2011)

- ✓ **Average vehicles' speed has increased between + 4,3% and + 11,4%**
- ✓ **During the morning peak hour the increase is higher (> 15%)**

# 1 month of AreaC - PT speed in the whole city



Velocità commerciale linee di superficie - rete esterna ad Area C



If compared to

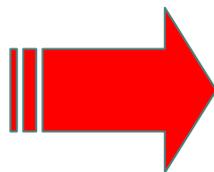
JANUARY 2012

NOVEMBER 2011

PT speed is...

≈

+ 4,9 %



AREA C has not the effect to increase congestion outside its boundaries

There is a general trend of traffic reduction due to the economic crisis and peak in oil prices



# AreaC - impact after 2 months



## Provisional data 16 January – 16 March 2012 First check of results in June 2012

- ✓ Commercial and private traffic during AREA C hours - **36%**
- ✓ Accidents - **52%** (- **44%** in the whole city)
- ✓ Public transport operating speed + **11%**
- ✓ Daily average emissions of pollutants in Area C:
  - Exhaust PM10 - **27%**
  - Ammonia - **45%**
  - Nitrogen oxides - **24%**
  - CO2 - **38%**

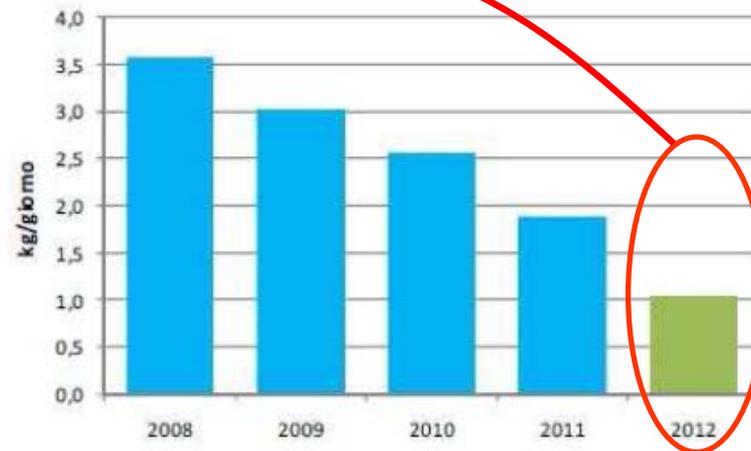


# AreaC - impact after 2 months - air pollutants



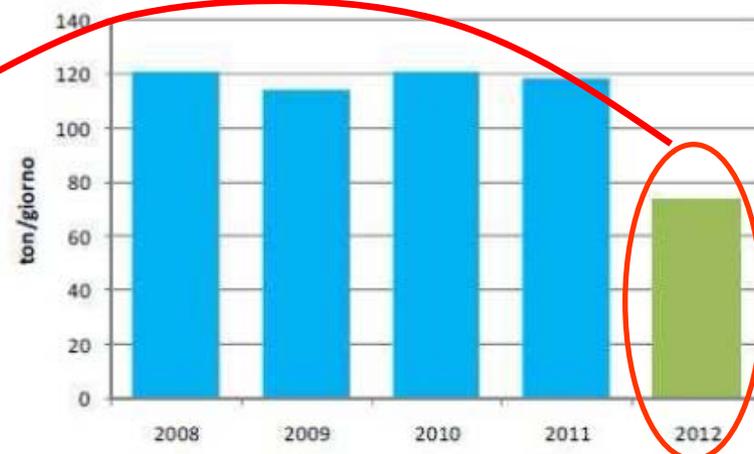
Estimated **PM10** emissions (kg/day) in AreaC compared with recent trends (2008-2011)

- 27%



Estimated **CO2** emissions (ton/day) in AreaC compared with recent trends (2008-2011)

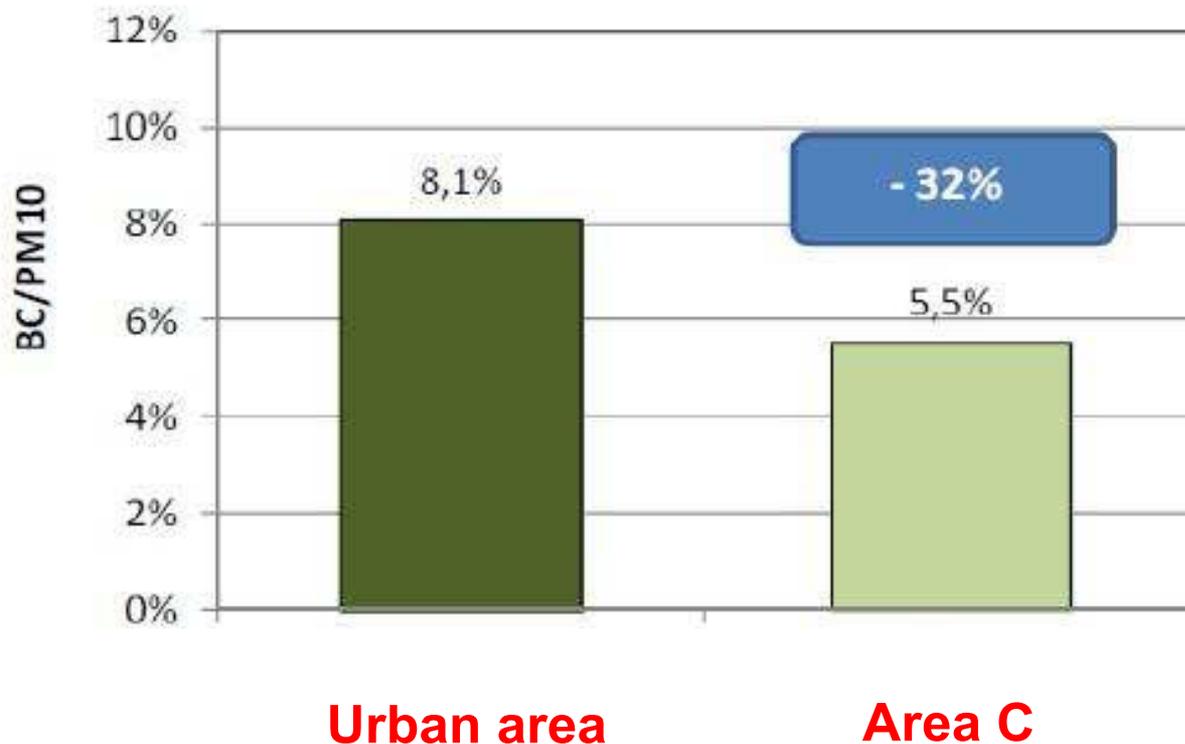
- 38%



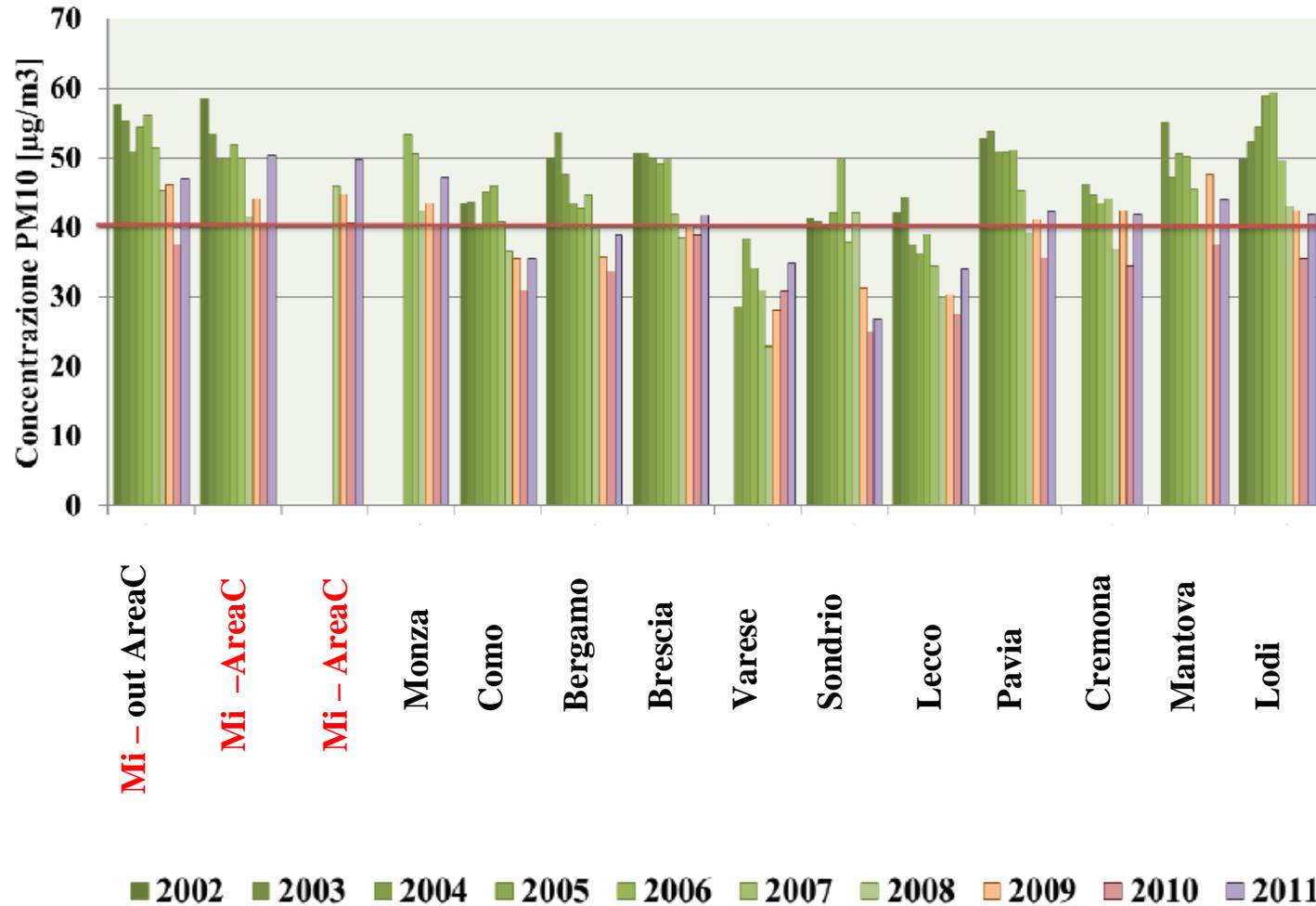
# AreaC - impact after 2 months - air pollutants



**Black Carbon  
PM10**



# PM10 concentration

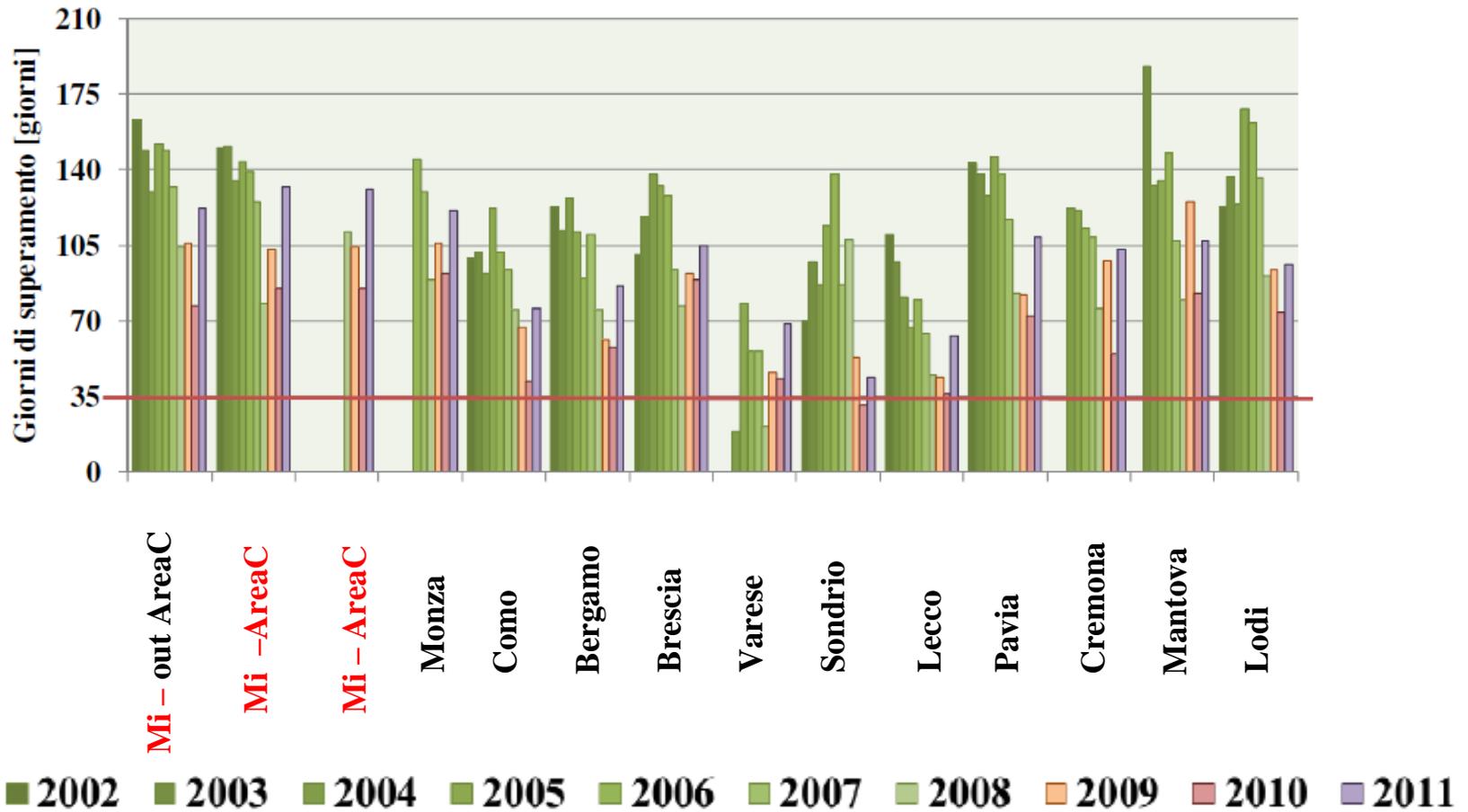


**Annual average PM10 concentration in Milan and Lombardy**

\* Source: [www.arpalombardia.it](http://www.arpalombardia.it)



# PM10 concentration



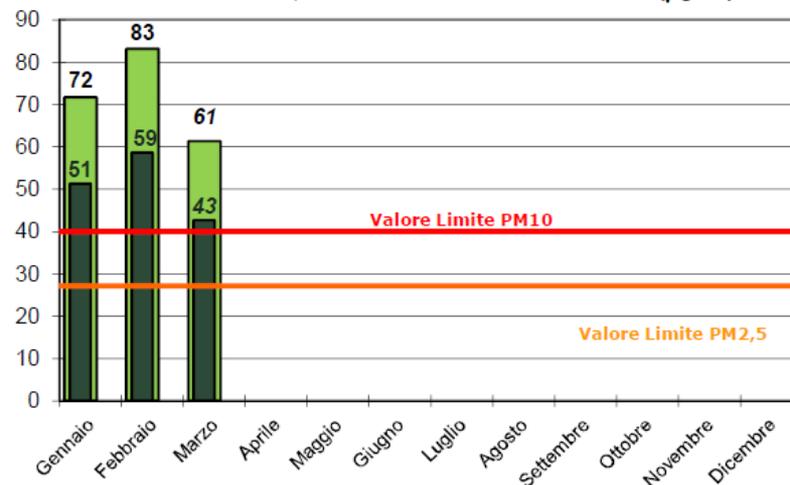
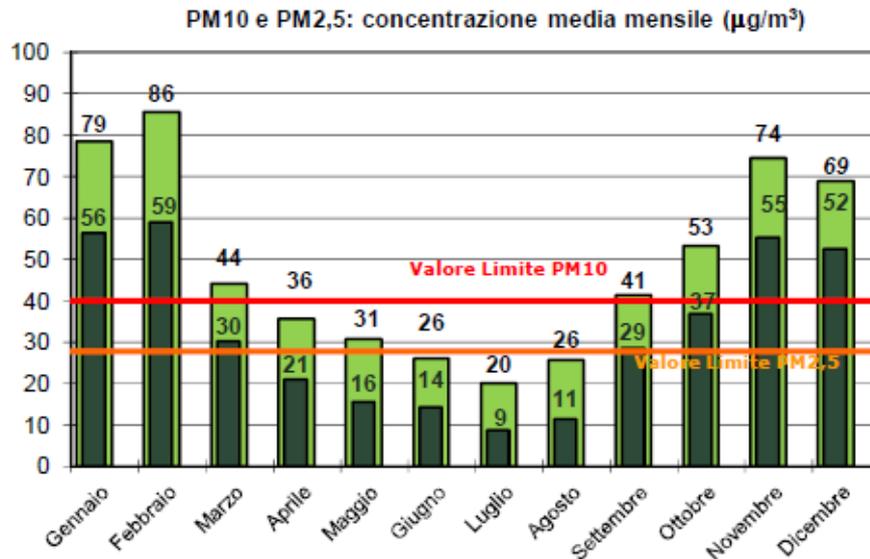
**Number of days exceeding the PM10 concentration limit**

\* Source: [www.arpalombardia.it](http://www.arpalombardia.it)



# PM10 concentration in central area

	PM10	PM2,5
<b>Valore Limite (<math>\mu\text{g}/\text{m}^3</math>):</b>	40	27
<b>Media 2007:</b>	51	34
<b>Media 2008:</b>	44	31
<b>Media 2009:</b>	45	31
<b>Media 2010:</b>	40	25
<b>Media 2011:</b>	49	33
<b>Media mobile attuale (dal 23/03/2011 al 22/03/2012):</b>	50	33
<b>Media anno 2012 parziale (dal 01/01/2012 al 22/03/2012):</b>	73	51



\* Source: [www.arpalombardia.it](http://www.arpalombardia.it)



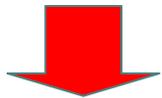
# Recent trends in mobility in Italy

AUDIMOB\* - Mobility Survey 2011 (comparison with 2010)

## Main indicators



- 4,5% in pax/km



- 14% total amount of trips



-2,8% mobility rate

The crisis affects also mobility demand

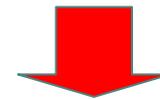
## Mode of transport



-22,3%  
bicycle/walking trips



-15% moped-scooter



-12,2% car



+3,7% PT modal share  
in big cities

\* ISFORT – [www.isfort.it](http://www.isfort.it)



Thank you for your attention

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