Session
Integration of modes & measures, and partnerships for clean mobility

Kyoto Protocol and urban mobility in Rome

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Atac, Mobility Agency of the City of Rome
Realization of Rome’s Action Plan to achieve the Kyoto’s Protocol objective of Green House Gas Reduction
Objectives

- The Project is drawing up an Action Plan for the City of Rome as part of the implementation of the Kyoto Protocol.

- The Action Plan is defining the actions to be implemented in order to reach the goal of a 6.5% reduction in GHG emissions (as set for Italy) by the year 2012, as compared to the quantity of emissions in the year 1990.

Actions and tools involved

- Creating the **City Action Plan on GHG emission cuts**;
- Realisation of “**Pilot Actions**” within a City District and/or on the Departments of the City Administration, with check of the measures compared to estimates & forecasting of the Plan;
- **Public information** distribution through meetings, events and Internet networks

Start and End of Project

1st of October 2004 - 30th of September 2008
CO2 emission trend in Rome 1990-2002

In 2002:  CO\textsubscript{2} 88.6%    CH\textsubscript{4} 11.2%    N\textsubscript{2}O 0.2%
CO2 emission trend for the period 1990-2012
1990-2002 values are calculated; 2003-2012 forecasting with “business as usual” (BAU)

\[ y = 1.7319x + 97.267 \]

\[ R^2 = 0.9138 \]

Far from Kyoto: what to do?
The Rome Action Plan into reality

- Analysis of the necessary decrease (evaluation of 1990 and estimation of 2012 CO2 emissions) in each sector;
- Definition of a common strategy for the overall reduction;

**2012 Objective:**
reduction up to **12.388 kT CO2 eq**
(-6.5% of 13.249.2 kT, 1990 emission value)
Rome: The impacts of the mobility problems

Traffic inducing:
- Congestion
- Pollution
- Safety risks

Impacting on:
- Health
- City attractiveness
- Economic growth
- Quality of life
From the problem to the solution: the Management of Mobility issues.

- **Traffic Demand Management** (Urban traffic Masterplan, PT priority, access limitations, area pricing)
- **New “Hard” Mobility Infrastructures** (Underground and Urban Rails)
- **New “Mobility Corridors” and Reserved Lanes** (Surface Transport)
- **Fleet Renewal & Monitoring** (bus and cars, towards lower emissions)
- **Technologies and ITS** for management, monitoring and enforcement
- **Sustainable Mobility (EC CIVITAS Initiative) package** (car sharing, car pooling, mobility soft measures, awareness)
The model: 5 concentric zones

- Municipality Area: 1285 skm
- External Ring (GRA): 344 skm
- Green Belt: 154 skm
- Rail Ring: 48.4 skm
- LTZ: 5.5 skm
- Pedestrian: 0.5 skm

Constraints:
- No Constraints
- Tourist Coaches Regulation
- Pollution emergencies
- Multi-modal nodes
- Park&ride
- Emission Constraints
- Pay parking schemes
- Stop to All Vehicles (permission concession)
- Zero Emission Area (walking & electric)
ITS technologies: Rome Mobility Centre

Public Transport

Private Transport

Regulation

Monitoring

Information

Control

Safety & Security

ITS and Rome mobility system

FLEXIBLE, INTEGRATED AND PREDICTIVE SYSTEM
Private mobility evolution
(% variation 1996-2004)

<table>
<thead>
<tr>
<th></th>
<th>4-wheels</th>
<th>2-wheels</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variation</td>
<td>-5%</td>
<td>13%</td>
<td>-3%</td>
</tr>
</tbody>
</table>
ITS in Rome: the electronic gates

Historic City Centre: 23 access gates

Trastevere: 12 access gates

The LTZ
Extension:
LTZ San Lorenzo
LTZ Villa Borghese
Methodology for estimating CO2 emissions

- **City development plans**: actual situation and 2012 scenario
- **The supply for PT and private transport**: actual situation and 2012 scenario;
- **Vehicular fleet** to be divided into classes based on COPERT III categories (ACI data)
- Traffic flows on the network estimated through simulation models (TransCAD)
- **CO2 emissions** estimated with COPERT III methodology
- The territory of the Council of Rome divided into **traffic zones** depending on territorial homogenity and mobility criteria
- For each traffic zones estimated the CO2 end of pipe emissions
Residents & employees in the Municipality of Rome
Composition & estimated evolution of the vehicular fleet

- GPL Euro I e successive
- GPL Convenzionali
- Diesel Euro I e successive
- Diesel Convenzionali
- Benzina Euro I e successive
- Benzina ECE 15-00/01/02/03/04
- Benzina PRE ECE

ACI data > years 2000-2005
Estimations > years 2006-2012
2006 – Actual network

**TRASPORTO PUBBLICO**

<table>
<thead>
<tr>
<th>Servizio</th>
<th>Estesa Km</th>
<th>n° fermate</th>
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</thead>
<tbody>
<tr>
<td>Linea A</td>
<td>18,4</td>
<td>27</td>
</tr>
<tr>
<td>Linea B</td>
<td>18,2</td>
<td>22</td>
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<tr>
<td>Tram</td>
<td>38,0</td>
<td>188</td>
</tr>
<tr>
<td>Roma Lido</td>
<td>28,8</td>
<td>13</td>
</tr>
<tr>
<td>Roma Nord(1)</td>
<td>13,3</td>
<td>16</td>
</tr>
<tr>
<td>Roma Pantano</td>
<td>17,8</td>
<td>30</td>
</tr>
<tr>
<td>FR(2)</td>
<td>112,7</td>
<td>53</td>
</tr>
<tr>
<td>Corridoi</td>
<td>12,8</td>
<td>16</td>
</tr>
<tr>
<td><strong>TOTALE</strong></td>
<td><strong>260,0</strong></td>
<td><strong>365</strong></td>
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(1) tratta urbana Montebello-Flaminio
(2) Tratte urbane
2012 Scenario: the evolution of the PT network

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<td>22</td>
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<tr>
<td>Linea C</td>
<td>7,0</td>
<td>9</td>
</tr>
<tr>
<td>Linea B1</td>
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<td>5</td>
</tr>
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<td>16</td>
</tr>
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<td>133,4</td>
<td>207</td>
</tr>
<tr>
<td>TOTALE</td>
<td>395,3</td>
<td>586</td>
</tr>
</tbody>
</table>

(1) tratta urbana Montebello-Flaminio
(2) trasformata in metropolitana
(3) tratte urbane
(4) più chiavi di fattibilità
# Evolution of PT infrastructural offer

**Investment Plan of 3.000 Millions Euro**

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2012</th>
<th>Change</th>
</tr>
</thead>
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<tr>
<td>Urban railways (km)</td>
<td>112</td>
<td>123</td>
<td>(+10%)</td>
</tr>
<tr>
<td>Underground (km)</td>
<td>36</td>
<td>47</td>
<td>(+30%)</td>
</tr>
<tr>
<td>Bus Corridors (km)</td>
<td>13</td>
<td>130</td>
<td>(+900%)</td>
</tr>
<tr>
<td>Rail Network (km)</td>
<td>206</td>
<td>395</td>
<td>(+190%)</td>
</tr>
<tr>
<td>Stops (n.)</td>
<td>365</td>
<td>586</td>
<td>(+160%)</td>
</tr>
<tr>
<td>Seats/km (ml)</td>
<td>5.8</td>
<td>8.2</td>
<td>(+140%)</td>
</tr>
</tbody>
</table>
The future underground system
Central zone (8 km)- 30mt. Deep - Roman

Peripheral zone (10 km)- deep - Roman and local

Suburban zone (7 km)- surface transport
Historycal buildings and monuments

Zone involved in the metro constuction works
Bus Fleet Management & Renewal Plan

- 12 Hybrids Bus
- The Largest Electric Fleet in Europe:
  - 52 minibus
  - 1.500 000 km/year
  - 3 mln passengers/year
  - 5 lines
- 7 bus powered with biogas
- 371 bus EURO III CRT (= EURO IV)
- 30 New Bi-modal Trolley Bus
  - 1 new Trolley Bus line
- 200 (+200) CNG bus

Fleet Average Age: 6 years (12y in 1998)
Interventions on road network
Trends on CO2 emissions in the city (1990 – 2012)

1990 – 2006

Zone | %
--- | ---
1 | -38.6%
2 | -16.8%
3 | -14.2%
4 | -17.3%
5 | +25.4%
Total | -5.6%

2006 – 2012

CORRECTIVE ACTION
The evaluation of CO2 variations 1990-2012

...Notwithstanding the huge expected efforts, emissions from mobility in Rome are far from the Kyoto objective!
### CUMULATIVE TABLE (CO2 Kton)

<table>
<thead>
<tr>
<th>Sectors</th>
<th>1990</th>
<th>2012 (Kyoto objective)</th>
<th>2012 (Present Status)</th>
<th>Distance from the objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>4.258,2</td>
<td>3.981,4</td>
<td>3.987,1</td>
<td>5,7</td>
</tr>
<tr>
<td>Transport</td>
<td>3.752,5</td>
<td>3.508,6</td>
<td>4.165,3</td>
<td><strong>656,7</strong></td>
</tr>
<tr>
<td>Tertiary</td>
<td>1.863,7</td>
<td>1.742,6</td>
<td>3.105,4</td>
<td><strong>1.362,8</strong></td>
</tr>
<tr>
<td>Waste</td>
<td>1.200,0</td>
<td>1.122,0</td>
<td>253,0</td>
<td>-869,0</td>
</tr>
<tr>
<td>Energy</td>
<td>958,6</td>
<td>896,3</td>
<td>943,2</td>
<td>46,9</td>
</tr>
<tr>
<td>Industry</td>
<td>411,8</td>
<td>385,0</td>
<td>387,6</td>
<td>2,6</td>
</tr>
<tr>
<td>Agriculture</td>
<td>260,7</td>
<td>243,8</td>
<td>154,2</td>
<td>-89,6</td>
</tr>
<tr>
<td>Gross Emissions</td>
<td>12.705,5</td>
<td>11.879,7</td>
<td>12.995,8</td>
<td><strong>1.116,1</strong></td>
</tr>
</tbody>
</table>
Further steps

- Analysis of further policies towards the reduction of emissions from private traffic, according to city development (PRG);

- Implementation of local policies - the case of XV° Borough;

- Integration with other sectorial studies;

- Finalisation of the Municipal Plan for emission reduction for the respect of Kyoto protocol;

Rome approach: Integration into a unique picture...

Management of Public and Private Mobility

Urban and Mobility Infrastructure Planning

Monitoring of Congestion and Environmental Threats

Integration and Use of New Technologies
Thank you!

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