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The Environmental Impact of Automobiles in Italian Cities (1950-1974).

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Urban growth and building speculation

The earliest signs of the remarkable urban growth which pervaded Italian cities (particularly in the regions of the centre-north) during the second half of the 20th Century, became visible from the first half of the 1950s. The process of mass immigration from the southern regions to the cities where the leading productive sectors causing rapid economic growth were accumulating, became evident. That was the so called «miracolo economico» (economic miracle) which reached its peak between 1958 and 1964. Not only the great industrial centres of the north-west attracted immigrants, but also the cities of north-eastern central and parts of industrialized southern Italy.

Between 1951 and 1971, the 23 metropolitan areas of the country[1] experienced a population growth of almost 12.000.000 in 1971, while occupying 8.3% of the national territory, and they housed 49.4% of the entire population. The metropolitan areas of the centre-north doubled the number of their residents (from 8.418.296 of 1951 to 16.766.709 of 1971), whereas in the centre-south growth was less dramatic (from 6.345.205 to 9.934.832)[2].

Under the pressure of this unprecedented migration the reconstruction of the cities came under the control of private speculators and in particular of a «builders clubs» which catered for the interests of builders, building industry professionals, real estate owners, private speculators and investment banks[3]. It has been pointed out that «such a club extended its interests to all economic and social sectors, in line with the well known notion that "if the building industry thrives, all economy thrives"»[4]. It has also been calculated that between 1956 and 1965, investment in the building sector represented 12.5% of the GDP and that house prices increased

[1] Centre-North (in order of magnitude): Milan, Brescia, Turin, Genoa, Florence, Bologna, Venice, Padua, Trieste, Livorno-Pisa, Verona, La Spezia-Carrara, Ferrara, Biella, Parma-Modena-Reggio Emilia, Rimini-Ancona, Udine, Vicenza, Alessandria, Bassano del Grappa, Piacenza, Trento, Bolzano. Centre-South: Naples, Rome, Palermo, Catania, Bari, Messina, Taranto, Reggio Calabria, Cagliari, Pescara, Sassari, Terni.

[2] Cf. Tecneco (Ed.), *Prima relazione sulla situazione ambientale del paese*, Roma, 1973, vol. II, pp. 284-400. In particular, the area of Milan-Brescia went from 3.803.992 inhabitants to 6.351.017, Turin from 834.375 to 1.714.292; in the centre-south, Rome and Naples registered the highest increase passing, respectively, from 1.734.055 residents to 3.117.232 and from 2.713.015 to 3.652.745.

[3] To expand on the subject of events in Italian city planning cf. G. Campos Venuti e F. Oliva (Ed.), *Cinquant'anni di urbanistica in Italia 1942-1992*, Roma-Bari, Laterza, 1993; F. Indovina (Ed.), *Lo spreco edilizio*, Padova, Marsilio, 1972; C. De Seta, *Città, territorio e Mezzogiorno in Italia*, Torino, Einaudi, 1977.

[4] G. Dematteis, *Le trasformazioni territoriali e ambientali*, *Storia dell'Italia repubblicana*, Vol. II, *La trasformazione dell'Italia*. *Sviluppo e squilibri*, Tomo I, Torino, Einaudi, 1995, p. 666.

by 250% whereas the general increase in consumers prices was of 140%[5]. During the reconstruction years and the period of «miracolo economico» the building industry became, together with the car industry, the chief sector of the Italian economy. Clearly this had been the result of a precise political choice designed to enable the building industry to develop unhampered since it created jobs for a considerable number of otherwise unemployed workers (the building industry employed more than two million workers), providing at the same time, accommodation for the homeless.

During the 1950s and 60s therefore, urban growth was heavily influenced by private interests which at the same time delayed and conditioned urban planning. Cities thus ended up by spreading haphazardly while building speculation produced, over the years, a widespread lack of collective amenities which apart from depriving new building estates of the recommended «settlement fitness» specifications as set by planners, also gave way to densely built up urban areas lacking in essential services.

In fact the pace of growth was chaotic. By the end of the 1950s the number of rooms was over 47.000.000 units (with a population of 50.000.000) the majority of which had been built in the regions of the centre-north, where there was practically one room per resident. In the 1960s, during which 16.000.000 rooms were built, the expansion of housing was even more conspicuous, especially in medium size towns. The number of dwellings built, including those illegally built, went on growing inexorably through the 1970s. During this decade, as compared to a modest rate of population growth (of two million), 23.000.000 rooms were built, and owner residents reached 60% of the total[6].

What happened in Italian cities between 1946 and the end of the 1970s is very effectively summed up by planner Giuseppe Campos Venuti:

> «The cities of the miracle growth by virtue of a phenomenon called by architects “the oil stain”, meaning spreading in all directions, indiscriminately, invading the countryside not leaving aside indispensable space for future gardens or for services; a mighty block after another, interspersed by narrow gaps where streets are but narrow lanes, and with a density which only fulfils the arrogant wishes of building speculators. The communes watch powerlessly: while proprietors “allot” and sell without leaving aside one single square metre for amenities of collective interest, most of the time they demand to be paid for land where the communes will later have to build roads, drains, electrical networks, water and gas pipelines»[7].

[5] B. Secchi, *Il settore edilizio e fondiario in un processo di sviluppo economico*, in F. Indovina (Ed.), *Lo spreco edilizio*, pp. 3-46.
[6] G. Campos Venuti, *Cinquant’anni: tre generazioni urbanistiche*, in G. Campos Venuti e F. Oliva (Ed.), *Cinquant’anni di urbanistica in Italia 1942-1992*, pp. 13-34.
[7] Ibid., p. 15.

Within the above described context, the diffusion of private transport was regarded as indispensable in order not to hamper building expansion. The car, in fact, enabled an ever-growing number of people to reach the new suburbs in comfort and at a reasonable cost.

The car «boom»

The growth of private transport went hand in hand with building expansion. The car in Italy had not had a significant influence upon the organization of public transport and upon personal mobility, at least up to the early 1920s when the Fascist regime started the first motorways, boosting private transport.

It was only after the Second World War that the diffusion of the motorcar gained a new impulse: in 1946 private cars numbered 149.649, these increased to 342.021 in 1950. Still in 1950, production, which in 1945 had dropped to 2.093 units, as opposed to 55.553 of 1939, went over the pre-war level reaching the number of 101.310 cars. Notwithstanding the first symptoms of an economic recovery, the density rate of cars in circulation, i.e. the number of inhabitants per vehicle, continued to be very low in Italy. In 1950, for example, the rate was of one vehicle every 81.9 inhabitants, against a rate of 48.7 for West Germany, of 24.2 for Switzerland, 20.7 for Belgium, 17 for France, 15.2 for Great Britain, 5.8 for Australia, and 3.1 for the United States[8].

In 1959, in spite of the numerical increase in cars which had taken place between 1950-1958 an annual rate of 15.48%, we still could not speak of mass motorization. Italy continued to be essentially a country on «two wheelers» or, if you like, on «three wheelers», the typical little transit vans which clogged up urban traffic. Until the «economic miracle» years the expansion of private motorcars was characterised by an extraordinary increase in sales and circulation of scooters.

We can say that Italy joined the club of motorised countries only in 1964, at the end of an extraordinary period of growth already known as the «miracolo economico». In this same year, in fact, the number of cars on the road went over that of scooters: the «four-wheeler» (4.674.644) overtook the «two-wheeler» (4.656.035) by a mere 18.609 units.

In the economic boom years, between 1959 and 1963, car expansion grew alarmingly with a mean annual increase rate of 20.7%. In 1964, compared to 1950, car density went from 81.9 to 9.9 inhabitants per vehicle and cars on the road numbered more than three times the number of 1958.

From 1964 to 1974 there were 14.303.761 vehicles on the road and the mean density had reached 3.6 inhabitants per vehicle, 3.89 per car. Therefore 1974 marked the peak of the first

[8] The data have been worked out by the author. Statistics were provided by Aci, *Autoveicoli circolanti*, 1950-1975 and by Istat, *Annuario statistico italiano*, 1950-1975.

phase of the mass diffusion of the private motorcar. Beginning from 1975, in fact, commercial trends altered considerably, and the production of such car models as had hitherto characterised the country's market, were all but taken out of the market, being replaced by new cars designed to compete with an aggressive foreign competition. By the end of what may be rightly called the «motorcar revolution», Italy had become one of the countries with the highest density of vehicles in the world, having reduced to nothing the initial gap. The exceptionality of the Italian case was confirmed by the rate of expansion after 1974. In 1990, for example, Italy had the highest density of cars in Europe and was fifth in the world following the United States, Canada, Australia and New Zealand.

Cities with «cars up to the neck»

Following the sudden explosion of car sales between the end of the 1950s and the beginning of the following decade, in the principal cities of Italy and in many of its towns, road traffic had become a problem. In 1968 an important weekly magazine, «*Domenica del Corriere*», gave ample space to the chaos which pervaded the roads in all Italian cities with an article entitled «*Italy with cars up to the neck*»[9].

This situation had been reached because during the first half of the 1960s, local administrations were not able to make the right choices in urban planning following the growing demands for mobility, restricting themselves to vaguely pointing out the problem[10]. The explanations of this deficiency in decision making are essentially two. The first derives from the method. In fact, in Italy, statistical forecast techniques aimed at predicting traffic density growth by means of mathematical models, were practically unknown, or at any rate they were rather obsolete, since they did not consider political and administrative issues in urban planning, although these matters were regarded as priorities by Anglo-Saxon researchers. Furthermore no organised studies of traffic were available; the scanty data available was restricted to quantitative analyses which were mere collections of quantitative data concerning vehicles in circulation. The few enquiries on the origin and destination of vehicles in transit, carried out by the Automobile Club Italia (Aci)[11], bore little value since they did not take into account the reasons for movement and the use of road space.

[9] "L'Italia con l'auto alla gola", *La Domenica del Corriere*, October 15, 1968.
[10] Cf. *Notiziario Anci*, 1958-1974, in particular issues 12/1962, 6/1965, 10-11/1965, 7-8/1967, 10-11/1967.
[11] The Automobile Club Italia was founded on the 23rd of January 1905: the establishment of an association of car drivers was felt necessary after 1898, when the first Automobile Club had been founded in Turin, and this was followed by others in Florence, Milan and Genoa. In 1960 the Automobil Club Italia had 305 500 members. In 1975 Aci was officially acknowledged as a «public institution».

The second reason concerned the absence of adequate legislation on the matter. In fact the rules concerning land communication networks were still the ones addressed by the 1942[12] law on planning (a law passed at a time when in Italy, as a whole, there were only 73.790 cars) since Parliament was never able to pass a new general planning law. As a result there was a serious lack of areas destined for collective amenities (in the first place those destined for road networks and parking spaces) and the progressive deterioration of urban structures and transport system congestion.

During the course of the first half of the 1970s the traffic congestion in Italian cities remained practically unchanged, and not only that, we also observed the failure of the measures adopted by local administrations, all amounting to interventions in the area of traffic management and upgrading of infrastructures. Such were the measures upon which all administrators could agree. To solve the urban traffic problems, the *Associazione nazionale comuni italiani* (Anci)[13] (National Association of Italian Communes) proposed, in the pages of its news magazine, «the possibility of co-ordinating the infrastructure systems in great metropolitan areas with territorial and regional ones […], the development of systems of urban public transport based upon fast vehicles […] the study of efficient underground network systems, the planning of a network of urban toll and free motorways, the realisation of large car parks near city centres»[14].

The remedies put forward by the *Lega nazionale dei comuni democratici, regioni, province ed enti minori* (National league of democratic communes, regions, provinces, and minor institutions)[15] were not very different from those proposed by Anci. The organization of socialist, communist and republican communes proposed the rationalization of taxi ranks and bus stations, the building of underground passages and car parks, the building of inter-city coach stations, the ruling that new roads should not be less than 14 m wide, the institution of municipal offices for monitoring traffic, and to organise road traffic on the basis of speed and type of vehicle and weight[16].

Measures for regulating traffic actually enforced by local authorities concerned chiefly the checking of traffic flows (one-way streets, no left turning, installations of automatic traffic lights) and parking (establishment of «green zones» and pedestrian precincts, installation of

[12] The law of 1942 was restricted to prescribing that the general town planning programme should indicate the network of main roads.

[13] Anci was created in 1901 as a free league of communes. Up to 1926, when Fascism included it in a Confederation of autarchic institutions, it carried out propaganda activities concerning local autonomy causing an interesting meeting point between catholic, socialist and liberal-democratic administrators. In the post-war period Anci regained its role and its original independence.

[14] "Mozione degli amministratori di comuni e province presenti alla XXIV Conferenza di Stresa", *Notiziario Anci*, October-November 1967.

[15] Born in 1916, the «Lega dei comuni socialisti» (League of Socialist Communes) was suppressed in 1926 by the Fascist Regime. During the post-war period it changed its name into «Lega dei comuni democratici, delle regioni, delle province e degli enti minori» (League of Democratic Communes, Regions, Provinces and minor Institutions) following the joining of the Republicans (in Umbria) and of the Communist Party. In 1968, at the 5th Congress of Bologna, it changed its name into «Lega per l'autonomia dei poteri locali» (League for the Autonomy of Local Authorities)

parking metres). Some local administrations had instituted preference lanes reserved for public transport, with the purpose of easing traffic circulation and to increase the rate of speed of commercial traffic (hampered by cars, buses were restricted to an average speed of 15 km/h) even so, the lack of method and the scarcity of reserved lanes did not bring about the expected benefits. The failure of traffic engineering measures was essentially due to their fragmentary and casual nature. Local councils who adopted these measures not according to a careful plan, but as a result of pressures to intervene, often resulted in emotional reactions, coming from the indignant man in the street, fed up by the situation of urban circulation. Furthermore, the measures adopted by local administrations did not follow commonly shared criteria and often not even scientific criteria. This chaotic situation led experts into demanding the passing of national law dictating guidelines to which local authorities must adhere to. Lacking a firm legislation, many communes, chiefly medium size and small, had adopted no measures to deal with the chaos of vehicle circulation, whereas in the cities, such measures were applied rather irrationally and casually.

In large cities, beyond measures in the field of traffic engineering, other measures of a structural nature were applied. Generally speaking these consisted of by-passes and ring roads, whose final aim was to lighten the traffic of vehicles in historical city centres. In a few years, however, along these new roads, high density settlements dwellings and businesses were built turning by-passes into urban avenues with traffic congestion problems similar or superior to the original ones. Furthermore, often such by-passes and ring roads were planned with inadequate technical features for supporting the amount of traffic of the time and, therefore, were absolutely insufficient for absorbing the ever growing number of cars in circulation. This was because in Italy the budget allocated to road building went almost entirely to motorways, whereas to urban and ordinary roads only went negligible resources; half of what was budgeted for such roads in France and Britain, and one fifth of Germany's.

Restricted to larger cities were, eventually, envisaged ambitious plans concerning the building of urban underground or tower car parks, and of metropolitan railways in Milan, Turin, Genoa, Venice and Rome (among these only Milan and Rome got their underground lines). During the course of the 1970s, town councils continued to postpone any policy aimed at applying precise and rigorous rules in matters of urban traffic planning and control policies remained restricted to limited measures aimed at making the best out of what already existed and to rationalising, as far as possible, road traffic in an attempt to prevent the total breakdown of urban circulation.

Urban chaos, circulation crisis and pollution. The cases of Rome, Milan and Florence

[16] "Sul problema del traffico", *Il Comune Democratico*, March 1967.

Rome, Milan and Florence represent a case in point in illustrating the way local administrations confronted the problem of urban expansion and car traffic increase.

Concerning Rome, planners speak of a true «town-planning massacre», which took place chiefly during the years spanning from the second post-war period to the 1960s[17]. During this period the city was subject to a savage building speculation rush, led with the consent of a centre-right administration, by the vested interests of the aristocracy, of a builders' bourgeoisie, and by the Vatican owned «*Società Generale Immobiliare*»[18]. A comprehensive operative plan was only produced by the city council in 1962 and was only approved in 1965, when the city had already been overbuilt in disregard of any principle of fair administration.

This speculation exercise was accompanied by massive widespread illegal building, fuelled by the demands of a fast growing population (623.100 more inhabitants between 1955 and 1970). In 1962 illegal buildings occupied an area of 3.800 hectares; in 1977-78, during the development of an alteration to the general plan of 1962, illegal buildings amounting to 267.000 rooms were counted over an area of 5.000 hectares.

The dramatic lack of essential amenities of collective interest, the scarcity of green areas (2 m^2 per inhabitant), and a road traffic which was impossible to govern, created a situation apparent to all. Conducive to this situation was the slow progress of the works for the underground railway, the dismantling of tramway lines (from 182 km in 1953 to 43 km in 1966, with a decrease in the number of passengers from 396.320 to 77.897) the inadequacy of the road system, which had remained practically that of the ancient Roman roads.

An article appeared on «Quattroruote», the main monthly car magazine in Italy, which very effectively described the lack of any planning when speaking of an «almost comical example» concerning the enforcement of regulations established by the general operative town development plan:

> «An example of this (….) is the "bottle-neck of the Via Salaria". In order to ease the heavy traffic of cars and trucks on this road, the town-development plan contemplated a one way traffic flow to be made possible by the building of an alternative route running behind the mansion of an aristocrat. As it happens, on this site, a builders' co-operative had erected two luxury villas, with the result that now the authorities of the Capitol seek the key to the solution of a problem which has become insoluble, by means of the most audacious experiments»[19].

[17] Cf. F. Ciccone, *Roma: capitale senza piano*, in G. Campos Venuti e F. Oliva (Ed.), *Cinquant'anni di urbanistica in Italia 1942-1992*, pp. 241-258.

[18] On the events concerning the urban disfigurement of Rome cf. A. Cederna, *I vandali in casa*, Roma-Bari, Laterza, 1956; Id., *Mirabilia Urbis. Cronache romane 1957-1965*, Torino, Einaudi, 1965.

[19] "Un'automobile ogni metro quadro", *Quattroruote*, February 1956.

In 1966, when in the Province of Rome there were 624.009 cars in circulation (increased to 1.191.547 in 1974), the average speed of urban traffic was of 5 km per hour[20].

In spite of the institution, in 1962, of a *Citizens' Consultative Committee on Traffic* (Comitato cittadino consultivo del traffico), the city administration, under public opinion pressure, renounced the adoption of a serious policy aimed at redressing the balance of the transport system in favour of public transport, ever more congested. The proposed remedies put forward by the Commission of Enquiry on Traffic (Commissione di indagine sul traffico), established on November 1963, remained words on paper. The report spoke of «green-wave-routes» (itinerari ad onda verde), some kind of «urban motorways», of a traffic plan aimed at establishing priority for public transport and rigid parking regulations, of a «specialization» of traffic areas including «pedestrian precincts»[21]. The blatant inconsistency of the traffic policy put forward by the Capitoline administration – which, as we read in a report written by the commission, should not have «altered the existing urban equilibrium» or oppose «in any way» the «development of the city as envisaged by the operative plan» – was the fact that it failed to turn into pedestrians only the area included between Piazza del Popolo, Via della Mercede, Via del Corso and Trinità dei Monti, which aborted after only a ten day trial period[22]. In 1968, the administration, notwithstanding the violent reactions of public opinion (43% of all journeys were made on private cars, 40% on public transport), decided to close to traffic a portion of the historical centre and, in 1973, the park of Villa Borghese. Such restrictions remained largely ignored by car drivers. Rome also held the unenviable record of being the city with the highest level of pollution deriving form motor vehicles.

Already in 1960, both in the Via del Corso and in the underground passage by the Quirinale, a concentration of carbon dioxide of 0.3-0.5 per thousand was measured, and it was calculated that the level would stabilise around the 1.5-2 per thousand[23]. In 1967, motor vehicles in circulation, most of them obsolete, released in the air 269.040 tons of carbon dioxide, 31.289 of hydrocarbons, 11.700 of nitrogen oxides, 873 of sulphuric oxide, 383 organic acids, and 1.074 of dust particles[24].

In Milan, the first operative general town planning programme was approved in 1953, when already large sectors of the city showed a very high density of residential units, favoured as in Rome, by the reconstruction plan[25]. The 1953 plan showed all negative traits of the town-

[20] "Roma si ferma per il caos automobilistico. Un record mondiale: 5 chilometri all'ora", *L'Espresso*, November 6, 1966.

[21] Commissione per l'indagine sul traffico a Roma, *Il traffico a Roma: la situazione attuale e le previsioni fino al 1985*, Roma, Amministrazione comunale, 1968.

[22] "Commercianti contro urbanisti per l'*isola* di Roma", *L'Espresso*, January 9, 1966.

[23] "L'inquinamento atmosferico e lo sviluppo del traffico automobilistico", *Strade e traffico*, November 1968.

[24] L. Carriero, *Il costo di eliminazione dell'inquinamento in Italia*, Milano, Angeli, 1972.

[25] On the events concerning the urban growth of Milan cf. F. Oliva, *Milano: la «deregulation» urbanistica*, in G. Campos Venuti e F. Oliva (a cura di), *Cinquant'anni di urbanistica in Italia 1942-1992*, cit., pp. 223-240; "Politica urbanistica e sviluppo di Milano dal 1968 ad oggi", *Il Comune*

planning methods of those days: a high residential density – the plan envisaged the building of 2.500.000 dwelling rooms for a population of 1.280.000 residents which did not grow beyond the 1.750.000 units reached in 1973 – due to blown up growth forecasts which represented a concession to private speculators, the phasing out of industrial settlements and the resulting conversion of the central areas into services areas, the lack of collective amenities and, in particular, of public green (1 m^2 per inhabitant in 1961)[26]. Under the pressure of speculators, the addenda to the general operative plan of 1963 and 1969 failed to give results, and the situation remained unchanged until the publication of the new plan in 1976.

The planning measures concerning car traffic led to the development of a dense network of roads which, disregarding any rational consideration, created a chaotic system of circulation and lacking in any adequate parking areas. Furthermore, in Milan too, the enthusiasm for the private car led to the dismantling of tramway lines, which reduced from 302 in 1953 to 128 in 1966. In a belated attempt to find a remedy to this situation, the administration of Milan was one of the first to adopt measures aimed at easing the congestion of road traffic by forbidding the parking of cars between certain hours of the day: from 7:30 to 9:30 and 1:30 pm to 3:30 pm (the so-called «green zones») and by allocating certain areas of the city centre to pedestrians only. Notwithstanding such measures and the building of an underground metropolitan railway system, traffic problems remained practically unsolved. It is true that in 1964 in the province of Milan there were 469.552 cars, which in 1974 had increased to 1.233.285 (this meant 8.63% of all cars in circulation in Italy). Every day (1972) 342.000 cars came into the city bringing in 74% of all commuters, whereas commuting cars numbered to 670.000 daily (only 33% of commuters used public transport).

As to the quality of the air, Milan was, after Rome, the city with the highest level of polluting emissions produced by motorcars. In 1955 it was shown that in the air of central streets there were from 0.48 to 2.24 mg of lead per g. of dust, and in the air of peripheral streets from 0.40 to 0.88 mg[27]. In 1967 vehicle exhausts discharged into the air 164.160 tons of carbon dioxide, 31.295 of hydrocarbons, 6.815 of nitrogen oxides, 533 of sulphur dioxide, 234 of organic acids and 655 tons of dust particles[28].

The head city of Lombardy showed in 1972 a level of sulphur dioxide of 0.0196 kg/m^3, against a national average of 0.0019 kg/m^3.

Due to its poor environmental situation, in 1996, the environmental association *Italia Nostra*, the *Centro studi attività politiche* (Centre for the study of political activities) and *Ente*

Democratico, June 1974; "Un'alternativa urbanistica per Milano", *Il Comune Democratico*, September 1974.

[26] "Il verde in città", *Quattroruote*, June 1961; cf. also A. Cederna, *La distruzione della natura in Italia*, Torino, Einaudi, 1975, pp. 324-337.

[27] "I gas nocivi emessi dagli autoveicoli", *Inquinamento*, June 1971.

[28] L. Carriero, *Il costo di eliminazione dell'inquinamento in Italia*, pp. 40-50.

provinciale per il turismo (Tourist office), organised in the city of Milan the first important public awareness campaign concerning air pollution called «*Aria per Milano*» (Air for Milan).

Up to the mid 1950s, Florence, not having an operative development plan yet, expanded in a disorderly fashion[29]. Its urban lay-out was, from 1958, further undermined with the approval of an operative plan allowing intensive development in the plain (with a density of $7m^3/m^2$ to $20m^3/m^2$) allowed building on the hills and left the city centre without real protection. Furthermore, planners allowed only small areas for common green and services. An attempt to correct this situation was made by the *Detti Plan* of 1962 – from the name of the Councillor responsible for urban planning, member of centre-left coalition, who promoted it – which established, as a priority, the protection of the city centre, it reduced building density, increasing the space designated for public green and services, directing the expansion of built up areas towards the north-west.

After the crisis which, in 1964, led to the fall of the centre left coalition in the local government, the Detti plan was de facto shelved, without raising any protest from the part of public opinion. The numerous addenda to the plan, approved in the 1960s and 1970s, encouraged, in spite of a relatively modest growth in population, very substantial development which led to the doubling in size of the urban area by adding 220.000 rooms to it (a 45% growth).

In this situation the road network too, along with public green and service areas, suffered to the benefit of building speculation. The decided shift of the city towards services accompanied by an inadequate communication system caused traffic congestion problems well in advance of other medium-size cities. Between 1952 and 1964, in the province of Florence, the rate of increase of private motor vehicles reached 634.33%. In 1964 there were 163.308 vehicles on the road (147.614 of which were cars) one car every seven inhabitants. In 1974 the rate increased to 428.135 vehicles (397.066 of which were cars) one car every 2.77 inhabitants.

One should not, therefore, be surprised if aerial photographs taken in the 1960s show the roads of Florence occupied by a great snake of cars and if squares were only huge car parks, with cars parked right to the steps of the churches of Santa Croce and the Cathedral of Santa Maria del Fiore. When in 1964, the Borough Commissioner, Lorenzo Salazar, tried to rid the city centre from cars with a bill which banned cars from the medieval heart of the city. A protest led by Christian Democrat MP Salvatore Foderaro, president of the parliamentary group «*Amici dell'automobile*» (Car friends), induced Salazar to withdraw his bill[30]. Only in 1971, despite the protests of traders and residents, a limited traffic zone, called «zona blu» (blue zone) was enforced. Over the years the traffic situation, in spite of works on existing structures and new roads, did not improve. The various road trunks appeared, in fact, disjointed and car circulation

[29] For a comprehensive coverage of urban developments concerning Florence cf. G. Campos Venuti and O. Reali, *Firenze: l'urbanistica contrattata*, in G. Campos Venuti e F. Oliva (Ed.), *Cinquant'anni di urbanistica in Italia 1942-1992*, pp. 313-327.

[30] "Otto giorni a piedi", *L'Espresso*, January 9, 1966.

remained restricted to the system of avenues which crossed the city from the southern outskirts (Rovezzano) to the northern (Peretola), whereas in place of a true ring road, road belts connecting the motorway to the city were built. To aggravate the existing traffic problems were both the lack of an appropriate system of car parks and the dismantling of tramway lines (from 65 km in 1953 to 0 in 1966). So far as the environmental situation is concerned, Florence appeared to be one of the most polluted cities in Italy. A survey carried out by the *Istituto di chimica analitica* of the University of Florence, found that road traffic and domestic central heating systems were the chief sources of pollution[31]. Measurement made in Autumn 1972 and winter 1973, showed, in the air, high percentages (0.0035 kg/m^3) of sulphur dioxide and the presence of calcium, aluminium, silica, magnesium, manganese, iron, vanadium, copper, zinc and nickel, beside high quantities of lead (average of 7μ/m^3) and polycyclic aromatic petrol released by vehicle exhausts.

The situation which we have illustrated concerning the three cities not only applied to all medium size and large cities in Italy but often to centres of modest size, so much so that in 1973, the first report on the environmental situation of the country produced an alarming picture of the urban environment[32].

The discovery of pollution

Italy had «officially» discovered pollution in March 1971 when the president of the Senate, Amintore Fanfani, promoted the institution of a *Comitato d'orientamento sui problemi dell'ecologia* (Orientation Committee for Ecology problems)[33]. In 1973, the conclusions of the *Prima relazione sulla situazione ambientale del paese* (First report on the environmental situation of the country) provided the first scientifically relevant data concerning the «state of health» of urban areas.

According to what was reported in the document, Italian cities continued to occupy the last positions in the European scale regarding the relationship between the number of inhabitants and green areas: 2m^2 for Rome, 1,5 for Turin, 1 for Milan, 0,58 for Naples (where in 1973, 27 residential districts did not have any green areas) in Florence the inhabitants of new residential districts, when they did not have any green areas, they had about 0.70 m^2 of public green per head[34].

The values of noise measured in various Italian cities were decidedly higher to the standards regarded as acceptable (up to 50 dB) and appeared to be produced for the greater part by road

[31] "Contributo alla conoscenza della composizione chimica del pulviscolo atmosferico campionato nell'area urbana di Firenze", *Inquinamento*, July-August 1973.
[32] Tecneco (Ed.), *Prima relazione sulla situazione ambientale del paese*, pp. 284-400.
[33] Senato della Repubblica, *Problemi dell'ecologia*, 2 Voll., Roma, 1971.
[34] "Il verde in città", *Quattroruote*, June 1961. A comparison with others european cities: Amsterdam 30 m^2; Stockholm 25; Cologne 20; Munich 16; Copenhagen 12; Moscow 11; London 11; Paris 8.

traffic. In the streets of Milan (1959) values of 85-90 dB had been recorded, in Rome (1968-1969) levels reached 60-100dB, and in Bologna (1972) 85-100 dB. As far as air pollution was concerned, beyond industrial fumes, the chief sources of pollutants were domestic central heating plants – between 1966 and 1971 the consumption of fuels had practically doubled going from $114.109\text{-}10^9$ Kcal to $225.934\text{-}10^9$ Kcal – and in motor vehicles. It was estimated that in 1968, 42% of the population lived in «high risk» areas[35], and that deaths due to diseases connected with air pollution amounted to 66.799 (those directly caused by this were 10.371), cases of disease amounted to 6.500.500, hospital cases and hospital days amounted respectively to 80.000 and 13 millions, working days lost to 3.600.000. Between 1966 and 1971, motor vehicle emissions had increased altogether by 46.3%. Dust emissions had increased by 6.7%, sulphur dioxide by 6.5%, nitrogen oxides by 7.2%, hydrocarbons by 7.6% and carbon dioxide and lead by 8%.

In 1972 motor vehicles in circulation had produced 5.425.000 tons of carbon dioxide, 746.000 tons of hydrocarbons, 215.000 tons of nitrogen oxides, and 20.500 tons of «particle matter». In almost all urban areas with heavy traffic, the level of nitrogen oxide reached 100-150 ppm, when the admitted limit was 20-50 ppm, furthermore, the blood of people «not exposed for occupational causes to lead rich environments» contained high concentrations of lead amounting to 20-80 mcg per day in excess of the danger limit set at 8 mcg/100 ml of blood. Concerning nitrogen oxides and oxidising substances there were no available data[36].

In Italy, the car was singled out as one of the main causes for air pollution from the 1950s. The Public's attention was only sporadically drawn to the problem of traffic noise, but not yet to air pollution caused by motor vehicles. One of the reasons for this was the widespread opinion that concern for the environment was a mere attempt to preserve the privileged life-style and cultural values of an élite. The protection of the environment was regarded as a luxury only affordable by the few who enjoyed a high standard of wellbeing. For this reason all questions concerning environmental policies were held as being much less urgent than those concerning the improvement of living standards and a minimum of social welfare to larger sectors of the population who still lived in poverty conditions.

In November 1957 the World Health Organization held a «*Congresso per l'inquinamento atmosferico*» (Convention on air pollution) in Milan, in which fifty delegates from twenty three European countries took part. From this congress came data which the «Pirelli» magazine described as being «more alarming than anyone could envisage». For the first time, cars were pointed out as «a source of danger» and from the works presented it emerged that in certain

[35] Provinces: Trieste, Gorizia, Venice, Padua, Turin, Genoa, La Spezia, Livorno, Siracusa, Caltanissetta, Bari, Brindisi. Metropolitan areas: Milan (including the provinces of Varese, Como, Bergamo), Rome, Naples.

[36] R. Squillante, *Traffico e ambiente*, in Aci, *XXX Conferenza del traffico e della circolazione di Stresa*, Roma, 1973.

areas of Milan the levels of carbon dioxide in the air were similar to those in Los Angles, this meant one part of dioxide each 4.200 parts of air[37].

From 1960 the subject begun to be discussed in the specialised press which examined the relationships between the inhalation of car exhausts and the occurrence of certain diseases. The journal of the *Commissione per l'automobilismo industriale* (Commission for industrial motor car transport) of Aci, in its first issue of 1961, underlined the role of motor vehicles as sources of air pollution and listed the damaging effects of smog:

> «To the sources of pollution, which have become increasingly more concerning over the past decades, another has been added recently, one third, not less serious, constituted by the emission of products issued by internal combustion engines. […] The effects of smog and of fog may be: 1) truly intoxicating and even cause death, 2) irritating for the respiratory system and for the eyes; 3) disgusting or disturbing to the organism»[38].

The following year, the Aci weekly magazine pointed out the fact that in Italy there was no «law against gases», whereas the monthly magazine of the *Istituto sperimentale della Commissione strade* (Experimental Institute of the Commission for roads) of Touring Club, published an article with concerned undertones where diseases connected with air pollution were listed[39].

In 1964, on the September-October issue of the «*Annali della sanità pubblica*» (Public Health Annals), the minister of Health published a study by Prof. Cominelli, which unequivocally put under accusation road traffic, as one of the principal causes of pollution:

> «Motor traffic constitutes, as we know, one of the chief sources of urban air pollution. We have tried to establish statistics concerning global pollution, translating these into values which span from modest […] up to 25% in larger cities […]. Whatever the volume of pollution deriving from road traffic, we cannot avoid to attribute to motor vehicle exhaust a particularly dangerous quality […]»[40].

The expert of the ministry for Health believed «ill conceived» any optimistic attitude in this respect and, although he believed it to be a «vaguely fictional» hypothesis, regarded the «generalised use of different sources of energy from the present» as the only solution which would radically deal with the problem.

Notwithstanding the ongoing debate in the country, the first law in matters of air pollution was only passed during the second half of the 1960s[41]. As to motor vehicles, legislation consisted of

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[37] Cf. "La malaria delle città", *Pirelli*, January-February 1958.

[38] "L'inquinamento atmosferico nei riguardi dell'incidente stradale", *Automobilismo e automobilismo industriale*, January-February 1961.

[39] "Il traffico automobilistico e l'inquinamento atmosferico", *Le strade*, March 1962; "Aria pericolosa" and "Il veleno nel serbatoio", *L'automobile*, n. 31, 1962; "Non c'è legge contro il gas", *L'automobile*, n. 33-34, 1962.

[40] Cf. *Annali della sanità pubblica*, Vol. XXV, September-October 1964.

[41] Law July 13, 1966, n. 615. The regulations enforcing the law were only put into practice in 1970 and concerned central heating plants and vehicles with Diesel engines: industrial plants and vehicles with petrol engines (the great majority of vehicles) were excluded.

mere generic statements. The first ruled that motor vehicles must not «issue polluting discharges, however caused»; the second ruled that Diesel engine vehicles must not «issue fumes of a density above those established by regulations». The only concrete measure adopted by the text ruled that regular testing of motor vehicles should include checking polluting discharges; as to the installation on the vehicle of devices which reduced the toxic exhaust gases, the ruling established that the ministry of Health should have faculty to make this obligatory, only after having asked for many opinions.

In 1967 the monthly magazine «*Strade e traffico*» (Roads and traffic), dedicated a soundly based article to the relationships between air pollution and the development of urban traffic, quoting a study carried out by the Chase Manhattan Bank, the monthly highlighted the fact that transport constituted the chief source of pollution (59.8%), followed by industry (18.7%), power stations (12.6%) domestic central heating plants (6.2%), and refuse disposal plants by incineration (2.6%). Furthermore, motor vehicles represented the chief source of carbon monoxide[42]. The magazine highlighted the fact that in Italy the problem inherent with petrol engines had not been studied from a «really practical point of view», and pledged that European countries should adopt rigorous measures, established bearing in mind the urban planning situation, the situation of traffic and of the development of motorised transport, in order to «grant absolute safety for public health». In March 1969 *Italia Nostra* promoted a meeting in Milan on pollution caused by the motorcar, which had vast resonance throughout Italy[43].

Notwithstanding the vibrant tones of the internal debate and the growing alarm of the unstoppable depletion of the urban environment caused by the geometric increase in traffic and by air pollution registered in cities, only in 1971, following a European law (n. 70/220/CEE), the Colombo government passed a bill aimed at checking the concentration of polluting discharges by motor vehicles using petrol[44]. The measure dealt with the characteristics required to approve a vehicle those concerning the limiting of polluting gases should be included, and established that such fitness should be tested in the presence of a official from the Ministry of Health or from the Higher Institute on Health. The law contained, however, general rules which were restricted to the acceptance of the European guideline but failing to tailor it to the Italian situation: this made the provision little more than a declaration of intent.

Notwithstanding the progressive deterioration of the situation, during the course of the 1970s and ’80s adequate legislation on the matter was still lacking, no national survey project was conceived and no urgent measure was adopted, as wished by experts, to lower the levels of obnoxious substances present in vehicle exhaust. We can point to two chief reasons which determined such an underestimation of the environmental impact of the motor vehicle. On one

[42] “L’inquinamento atmosferico e lo sviluppo del traffico automobilistico”, *Strade e traffico*, November 1968.

[43] Italia Nostra-Csap-Ept «Operazione Aria per Milano», *Inquinamento atmosferico: processo all’automobile*, Milano, Grafiche A. Nava, 1970.

hand was the resistance (and the requirements) of builders who were so powerful as to be able, in spite of the enormous amount of data testifying to the obvious relationship between the substances contained in car exhaust gases and the increase of urban air pollution, to postpone the enforcement of all recommendations put forward by experts. On the other hand, municipal administrations, save some declaration of principles, showed a scarce attention to the problem and did not exercise sufficient pressure upon central government to pass severe anti smog laws.

[44] Law June 3, 1971, n. 437.