TeMA

Journal of
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This special issue collects a selection of peer-review papers presented at the 8th International Conference INPUT 2014 titled "Smart City: planning for energy, transportation and sustainability of urban systems", held on 4-6 June in Naples, Italy. The issue includes recent developments on the theme of relationship between innovation and city management and planning.

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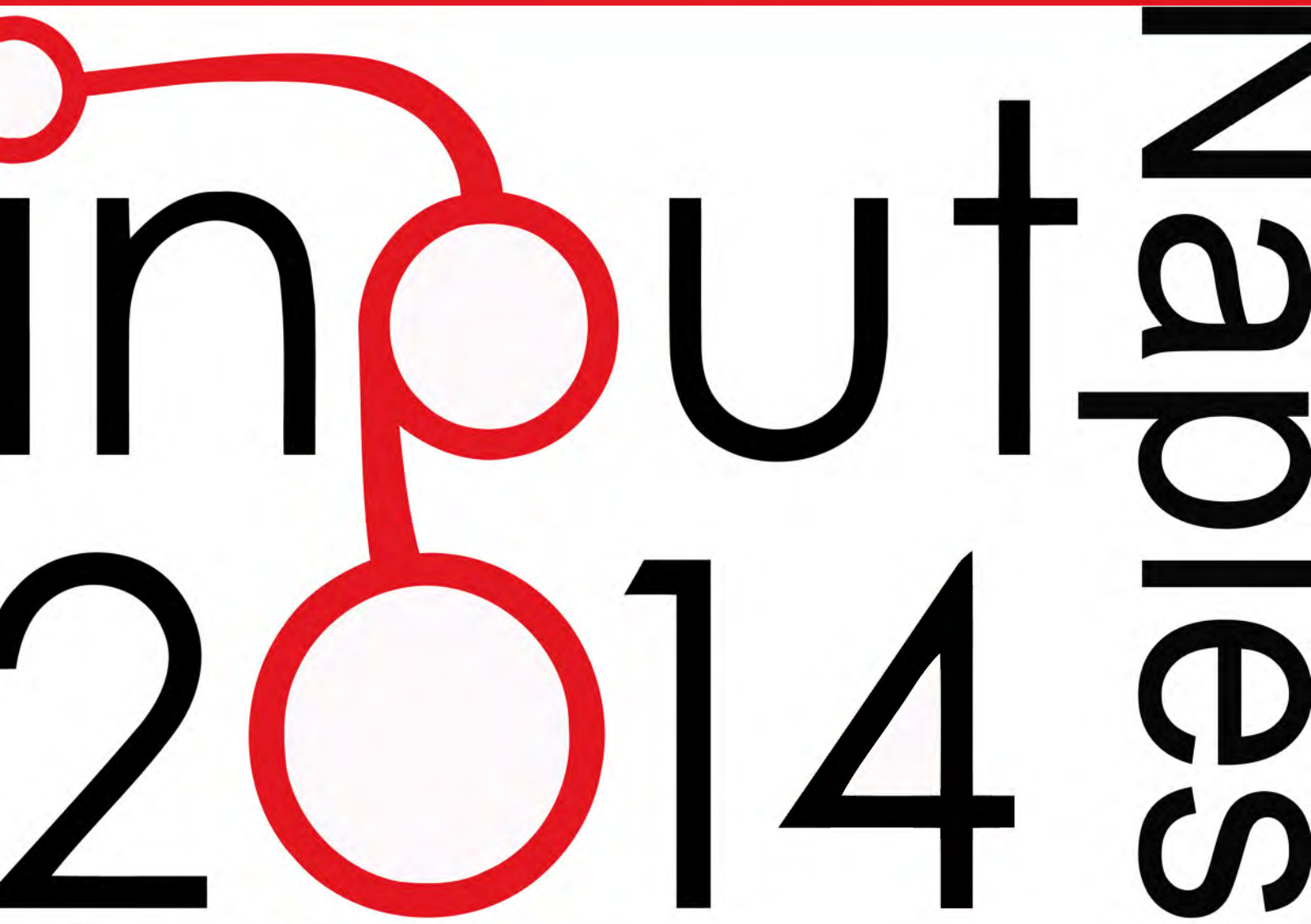


# Smart City

## planning for energy, transportation and sustainability of the urban system

Special issue, June 2014

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TeMA Journal of Land Use, Mobility and Environment

# SMART CITY

## PLANNING FOR ENERGY, TRANSPORTATION AND SUSTAINABILITY OF THE URBAN SYSTEM

## Special Issue, June 2014

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TeMA Journal of Land Use, Mobility and Environment

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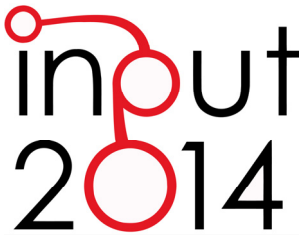
TeMA Journal of Land Use, Mobility and Environment

This special issue of TeMA collects the papers presented at the 8th International Conference INPUT 2014 which will take place in Naples from 4th to 6th June. The Conference focuses on one of the central topics within the urban studies debate and combines, in a new perspective, researches concerning the relationship between innovation and management of city changing.



TeMA Journal of Land Use, Mobility and Environment

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# EIGHTH INTERNATIONAL CONFERENCE INPUT 2014

## SMART CITY. PLANNING FOR ENERGY, TRANSPORTATION AND SUSTAINABILITY OF THE URBAN SYSTEM

This special issue of TeMA collects the papers presented at the Eighth International Conference INPUT, 2014, titled "Smart City. Planning for energy, transportation and sustainability of the urban system" that takes place in Naples from 4 to 6 of June 2014.

INPUT (Innovation in Urban Planning and Territorial) consists of an informal group/network of academic researchers Italians and foreigners working in several areas related to urban and territorial planning. Starting from the first conference, held in Venice in 1999, INPUT has represented an opportunity to reflect on the use of Information and Communication Technologies (ICTs) as key planning support tools. The theme of the eighth conference focuses on one of the most topical debate of urban studies that combines , in a new perspective, researches concerning the relationship between innovation (technological, methodological, of process etc..) and the management of the changes of the city. The Smart City is also currently the most investigated subject by TeMA that with this number is intended to provide a broad overview of the research activities currently in place in Italy and a number of European countries. Naples, with its tradition of studies in this particular research field, represents the best place to review progress on what is being done and try to identify some structural elements of a planning approach.

Furthermore the conference has represented the ideal space of mind comparison and ideas exchanging about a number of topics like: planning support systems, models to geo-design, qualitative cognitive models and formal ontologies, smart mobility and urban transport, Visualization and spatial perception in urban planning innovative processes for urban regeneration, smart city and smart citizen, the Smart Energy Master project, urban entropy and evaluation in urban planning, etc..

The conference INPUT Naples 2014 were sent 84 papers, through a computerized procedure using the website www.input2014.it . The papers were subjected to a series of monitoring and control operations. The first fundamental phase saw the submission of the papers to reviewers. To enable a blind procedure the papers have been checked in advance, in order to eliminate any reference to the authors. The review was carried out on a form set up by the local scientific committee. The review forms received were sent to the authors who have adapted the papers, in a more or less extensive way, on the base of the received comments. At this point (third stage), the new version of the paper was subjected to control for to standardize the content to the layout required for the publication within TeMA. In parallel, the Local Scientific Committee, along with the Editorial Board of the magazine, has provided to the technical operation on the site TeMA (insertion of data for the indexing and insertion of pdf version of the papers). In the light of the time's shortness and of the high number of contributions the Local Scientific Committee decided to publish the papers by applying some simplifies compared with the normal procedures used by TeMA. Specifically:

- Each paper was equipped with cover, TeMA Editorial Advisory Board, INPUT Scientific Committee, introductory page of INPUT 2014 and summary;
- Summary and sorting of the papers are in alphabetical order, based on the surname of the first author;
- Each paper is indexed with own DOI codex which can be found in the electronic version on TeMA website (www.tema.unina.it). The codex is not present on the pdf version of the papers.

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Eighth International Conference INPUT
Smart City - Planning for Energy, Transportation and Sustainability of the Urban System

*Naples, 4-6 June 2014*

# PLANNING PHARMACIES

## AN OPERATIONAL METHOD TO FIND THE BEST LOCATION

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**ABSTRACT**

The theme of the spatial distribution of the pharmacies on the territory is closely connected to urban planning and to services supply. In Italy, the regulatory change that took place in 2012, triggered partly by the need to adhere more to a constantly changing economic system, has led to a revision of the existing situation, consisting both on the method to quantify the pharmacies distribution and on the efficiency of the service. If Law 27/2012 has effectively allowed municipalities to increase the number of pharmacies that they can settle on the municipal territory, it has also started a process of rethinking the logic of pharmacies location and of their catchment areas.

In this framework, the present paper aims to discuss the merits of a regulatory evolutions that sparked the process of liberalization of locations, integrating the law guidelines and goals with an operating logic process, usable and useful to translate goals into planning actions in a continuous dialogue between law and territory, constraints and opportunities, equity and accessibility of the care services.

Following this logic operations, we have investigated the urban context of Castelfranco Emilia, assuming the location of new offices on the basis of pharmaceutical analyzes.

**KEYWORDS**

Pharmacy, spatial distribution, Law 27/2012, liberalization process, population density, equal care services, accessibility, GIS

# 1 URBAN AND REGULATORY CONTEXT

## 1.1 TERRITORIAL DISTRIBUTION OF PHARMACIES IN ITALY, BEFORE 2012

According to Article 32 of the Italian Constitution, the pharmaceutical service is intended as a public service preordained to health care and treatment of pain and it aims to ensure the proper dispensation of the means (drugs and services) used in its protection. This principle is laid down in Article 32 of Law no. 833 dated 23rd December 1978, which instituted the National Health Service; this law, in Article 25, includes pharmaceutical care (in the same way of medical-generic care, specialized nursing, hospital) in the care services borne by the Local Health Units (Giordani 2011).

For these reasons, the activity of pharmacies can be considered inside the aim of granting a public service.

This approach can be basically traced to the Giolitti reform of 1913, which stated that *"pharmaceutical care to the population, and therefore the practice of pharmacy, is a primary task of the state, carried out directly through by the local authorities (municipalities), or delegated to private individuals to be carried out, under a government license"*.

Before that, the principle of the free leading of the pharmacy prevailed (also known as CRISPI Reform, law no. 5849 dated 22nd December 1888): it was considered as a private asset and could be started without territorial constraints and limitations, with the only obligation of the responsible leading of a pharmacist, which could not necessarily be the holder or the owner of the pharmacy.

With the law of 1913, the owner of the pharmacy, while remaining a private individual, was bound by a relationship of special subordination to the Public Health Authority that, in the prevailing public interest, called back the power to impose obligations, performances and restrictions on the activity. Starting a pharmacy was not discretionary, but it was made on the basis of a planned action, the “pharmacies district” (called “pianta organica”) of the pharmaceutical location.

The tool of the pharmacies district was later confirmed in year ‘68 laws (Law 221/68 and Law 475/68), which, while making several major changes to the institute of pharmacy, maintained the public action in territorializing the service through the pharmacies district.

The pharmacies district is the outcome of the planning, at public level, of the equal distribution of pharmacies on the land, with the purpose of protecting the right to health, ensuring accessibility to the population in terms of equal and non-discriminating.

According to Article 1 of Law 457/68, the pharmacies districts the act in which "the number of the pharmacies, each individual location and the area of each of them are defined". The pharmacies map, then, was to be considered as an act that divided the municipal land into areas (defined as bordered areas of land), within which each pharmacy has to be set and work.

The criteria for the definition of pharmacies districts were then revised by Law 362/91 according to which:

- the number of authorizations is determined in order to have 1 pharmacy every 5,000 inhabitants in municipalities with a population of up to 12,500 inhabitants and 1 pharmacy every 4,000 residents in other municipalities (*quorum*, demographic criterion);
- every new pharmacy must be located no closer than 200 meters from the other pharmacies, and in order to satisfy the need of people in that area. That distance has to be measured on the shortest way between pharmacies’ doorsteps (topographic criterion).

The usual procedure that was followed to determine where a pharmacy had to be established, met the following logic: proceeding hierarchically, first the main town was taken into consideration, then villages and then hamlets, excluding villages and hamlets that already had a pharmacy.

## 1.2 THE INTRODUCTION OF THE LEGISLATIVE DECREE 1/2012 (NAMED "CRESCITALIA"), AND THEN ITS CONVERSION INTO LAW 27/2012

Article 11 of Law no. 27 dated 24th march 2012, that has converted the Legislative Decree no. 1 dated 24th January 2012, the so-called "liberalizations decree", has introduced, among others, some measures to reform the pharmaceutical distribution by modifying Law no. 475 dated 2nd April 1968, as amended.

Through this reform the legislator has set the goal, as well as to facilitate access to ownership of pharmacies by a larger number of candidates, to facilitate the procedures for opening new pharmaceutical locations, while ensuring a more widespread presence in the municipal territory of pharmaceutical services (art. 11, c. 1), an equal spatial distribution of pharmacies (art. 11, c. 1, letter c) and the extension of the accessibility to pharmaceutical services also to people who live in sparsely populated areas (art. 11, c. 1, letter c).

So the Law has provided:

- the modification of the standard demographic baseline, established so that there will be 1 pharmacy every 3,300 inhabitants, referring to the registered population at 31.12.2010;
- the planning of the new pharmaceutical locations on the territory, inside areas that are identified and chosen by municipalities according to the 3 goals cited above;
- in addition to the pharmaceutical locations previously determined, and within the limit of 5 percent of the locations, including the new ones, it is possible to establish a pharmacy:

  "a) in railway stations, in civil airports for international traffic, in maritime stations and in service areas, with hotel and restaurant services, on high traffic density motorways, provided that there is not already a pharmacy at a distance of less than 400 meters;

  b) in shopping malls and in large retail outlets with a sales area of more than 10,000 square meters, provided that there is not already a pharmacy at a distance of less than 1,500 meters".[1]

The new demographic criterion is quite clear, as it plans to open 1 new pharmaceutical location every 3,300 inhabitants (*quorum*). This means that the number of pharmacies that are up to each municipality is obtained by dividing the total number of inhabitants by 3,300 and rounding up; the difference between the so-calculated theoretical number of locations and the existing ones shall consist of the new locations, placeable according to the goals of equal and widespread geographical distribution and accessibility of pharmacy services also to people living in sparsely populated areas.

In addition, the condition of proximity should be also taken into consideration, expressing the exclusion of the placement of a new pharmacy within certain metric radii, as follows:

| | **Distance radius** | **Regulatory reference** |
|---|---|---|
| From another pharmacy | 200 meters | ex L. 475/1968 (e s.m.i.) |
| From a pharmacy in railway stations, in civil airports for international traffic, in maritime stations and in service areas, with hotel and restaurant services, on high traffic density motorways | 400 meters | ex L. 27/2012, derogating from the *quorum*, with a maximum number of additional openings equal to 5% on a regional basis |
| From a pharmacy in shopping malls and in large retail outlets ($S_v$ > 10,000 m²) | 1,500 meters | |

[1] The law has given to Municipal Councils and no longer to the Regional Authority the responsibility for the siting new pharmaceutical locations, so the Councils were required to adopt a deliberation to establish the new locations within 30 days after the entry into force of the Law that converts the Liberalisation Decree.

The new law has introduced some critical elements in siting new pharmacies.
First, a criticality can be identified in the lowering of the minimum threshold for opening a new pharmacy at 3,300 inhabitants and assigning an additional one on the criterion of "rest for excess" (ie the surplus population, compared with 3,300 inhabitants, allows to open another pharmacy, if it exceeds 50 percent of the parameter itself, so equal to 1,650 inhabitants); in fact, since the experience of the operators, it should be noted that pharmacies located in villages with a population of less than 1,000 inhabitants did not survive and they closed, so the rounding up of the ratio by which a one more pharmacy is assigned, can be further considered risky for the survival of the pharmacies in the area.
Second, the generic nature of the location goals (equal and widespread distribution, accessibility to those who live in sparsely populated areas) has made some locations questionable and has given raise to many appeals to the Administrative Court by the actual owners of the already existing pharmacies, highlighting the need to support these proposals with spatial analysis tools, in order to guarantee the achievement of law objectives and the transparency of the choices.
In fact, if the operation of liberalization made by the Law, as it might be guessed, leads to a reduction in the potential catchment area of the existing pharmaceutical locations, to some extent eroded by new locations. Therefore, it will be necessary to compare multiple potential locations for the new seats, if any, building possible scenarios in an analytical and punctual way, in terms of users and territorial accessibility, as well as in terms of reduction of the adjoining catchment areas, with the aim of minimizing losses to the existing (and future) seats and sharing the benefits on the as widely as possible amount of population.

# 2 WORKING METHOD

## 2.1 MAPPING OF THE BASIC ELEMENTS

The location of a new pharmaceutical seat must take into account some elements that could result potentially conditioning or synergistic compared to the service itself, which must be geo-referenced and mapped in order to allow to undergo the subsequent spatial analysis:

1. Pharmacies, as point features
2. Pharmacy district of each seat, as polygon feature (relevance area, usually described with words only)
3. Medical facilities, as point features
4. Groups of doctors (or UTAP, Territorial Units for Primary Assistance), as point features
5. Shopping malls (with $S_v$ > 10,000 $m^2$), as point features
6. Para-pharmacies, as point features without relevance areas.

Those elements become the subject of subsequent processing and evaluation as described below.

## 2.2 ANALYSIS AND LOCATIONAL CRITERIA

The evaluation of new pharmacies locations can't be divided from the analysis of the current situation, based on the existing catchment areas. Therefore, the analysis started from the configuration, both in form and essence, of the pharmacy maps of each different seat already present on the territory, also including the relevance areas ever assigned or already forecasted.

### *2.2.1 POPULATION DENSITY*

The law requires to determine the need for new pharmacies based on the residential population at 31.12.2010. However, although this data is available from the municipal registries as total number on the

main town and on villages, its spatial distribution for each house number on the whole territory is not always available.

To fill this gap in spatially geo-referenced information, data obtained from the last available census, at 2001, unbundled on census section, have been used (source: ISTAT). They have then been updated proportionally (on villages and hamlets) to the value of residential population in at 31.12.10. This operation could be addressed as an oversimplification; nevertheless it was necessary, in order to produce a geo-referenced database of the residential population also for those municipalities that are not able to provide this detailed information.

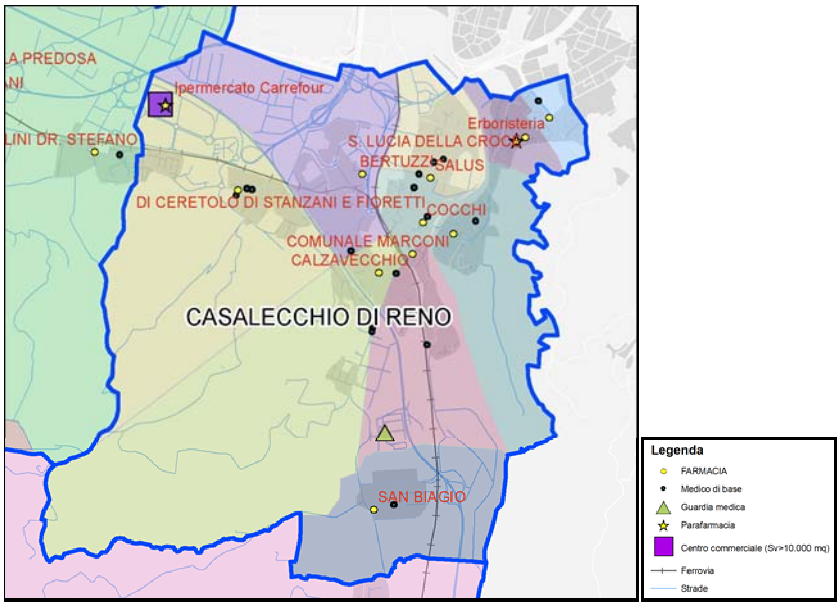



Fig. 1 The basic elements for the analysis: pharmacies, UTAP, medical facilities, para-pharmacies, shopping malls on the pharmacy map

In order to make these data more useful and targeted, using GIS software, the census sections have been crossed with the residential built-up ground cover (ie, excluding urbanized but not-built-up areas -green areas- and industrial and craft areas). The result is essentially the proportional allocation of the number of inhabitants, identified and referred to a large area (census section), only on urbanized and useful portions of the census section.

By doing so, we have tried to ensure a realistic distribution of the population on the urbanized territory, keeping the information on the age group, which is useful for the purposes of this study.

Through these steps, we obtained a map with the demographic distribution, in absolute terms, on the urbanized territory: this data, referring to different extents of land, does not give useful quantitative information in order to put two or more portions in competition; given the need to site new pharmaceutical locations that will serve the greater the more portion of the inhabitants, and then to plan the locations in an efficient and equal way, it is necessary to have data in relative terms, so referred to the portion of land on which they insist.

The total number of inhabitants of each portion of urbanized territory has then been divided by the area of the portion, in such a way to obtain a population density comparable on the entire municipal area (inhabitants/km$^2$).

By mapping this variable, it is possible to assess the competition between the different areas that are potentially suitable to accommodate new pharmacies, in order to highlight the “Best Location” in accordance to this criterion.

### *2.2.2 URBAN ACCESSIBILITY*

The criterion of accessibility to each pharmacy seat has been interpreted in order to intercept the higher number of inhabitants within 400 meters (6 minutes walk) and 2,000 meters (10 minutes by car) from its location, in order to compare some possible alternatives.

After having identified the possible locations based on the criterion of population density described above, some different future scenarios have been developed, verifying for each of the alternative locations the catchment areas served within 400 and 2,000 meters.
The best location is therefore sited inside the area that maximizes the number of served inhabitants.

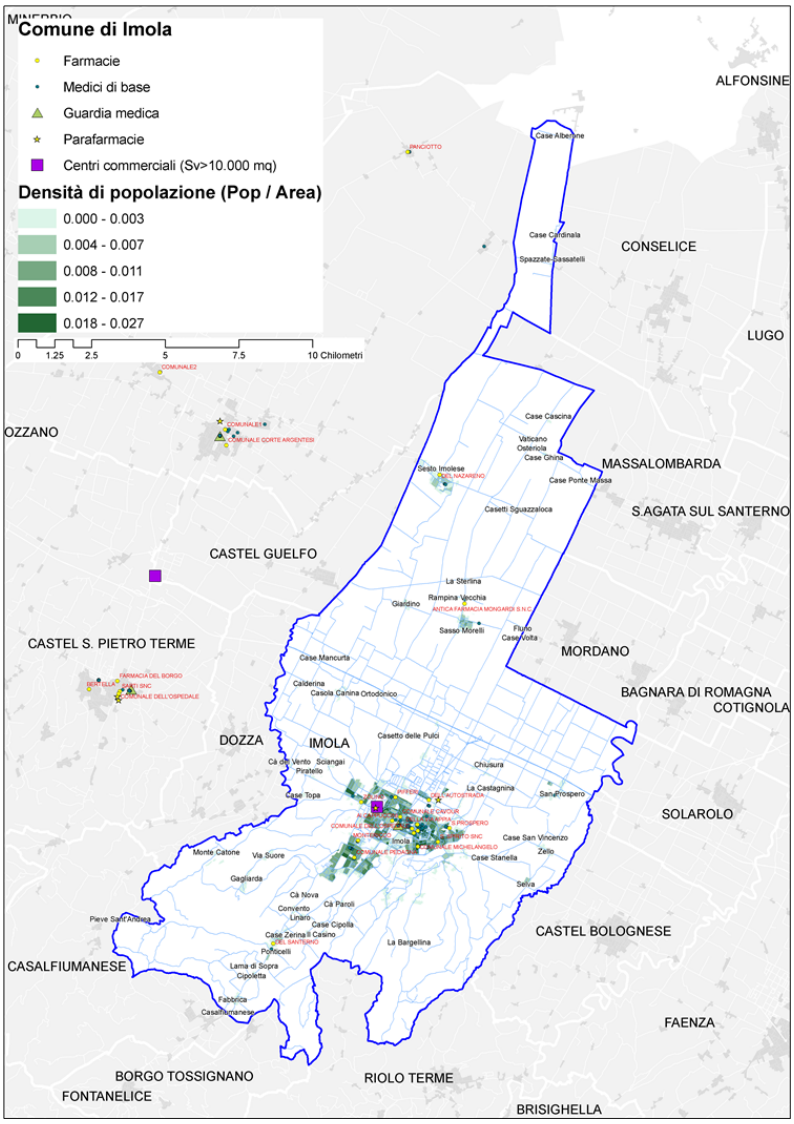



Fig. 2 An example: the distribution of population density in Imola territory

# 3 OPERATIONAL APPLICATIONS OF THE METHOD: THE CASE STUDY OF CASTELFRANCO EMILIA

The analysis and then the assessment of potential locations where to settle the new pharmacies is developed following the 3 goals of the Law and applying the criteria described in the previous paragraph; starting from the territorial level, we analyzed the hierarchy of settlements, ie their consistency in terms of inhabitants (in the catchment and in populated areas), proximity to other pharmacies and to UTAP, and, in some cases, possible street connections; once that some possible macro-areas where to site a new pharmacy have been identified, we have to come down to the urban level by analyzing in detail the catchment area of new and existing pharmacies within 400 meters and 2,000 meters, respectively corresponding to about 6 minutes walk and 10 minutes by car.
The result of the assessment could change if a more compact situation (thus with a capital center with a number of residents much more higher compared to the villages/hamlets) or a more widespread situation (so with towns of comparable consistency in terms of inhabitants) is examined.

## 3.1 EQUAL E WIDESPREAD DISTRIBUTION ON THE TERRITORY (GOAL1 AND GOAL2)

The municipality of Castelfranco Emilia, a municipality located along the Via Emilia in the Emilia-Romagna Region, has an area of 102.47 km$^2$ and a population of 32,102 inhabitants (as before 31.12.2010), highly concentrated in the main center (20,600 residents). The average density is therefore of 313.3 inhabitants/km$^2$. Using the demographic criterion (3,300 inhabitants per pharmacy + rest > 50%), Law 27/2012 allows 10 pharmacies to be opened in the municipality; on its territory there are already 7 pharmaceutical locations (fig. 3) to which it has to be added an eighth urban one, unassigned, already provided by the reform of the pharmacies districts completed in 2010, and located in the northwest quadrant of the municipality (fig. 3).

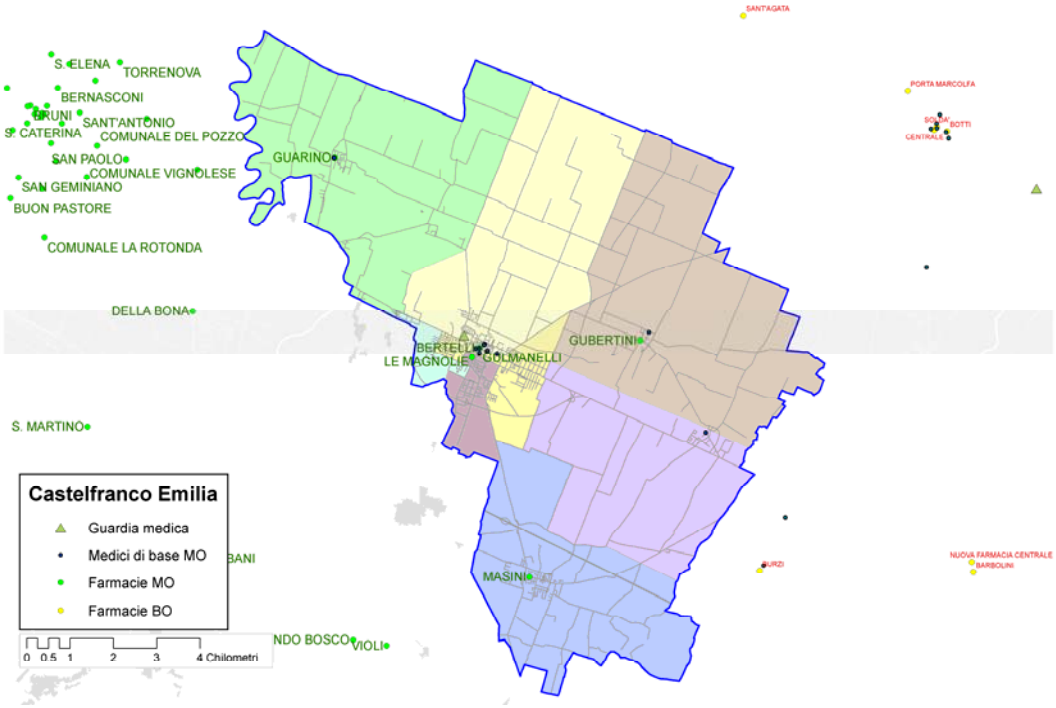



Fig. 3 The pharmacies district of Castelfranco Emilia

Assuming to settle only one of the two pharmacies still allowed, an equal distribution of the 9 pharmaceutical locations, existing or new, would mean, in a theoretical way, that each one would serve a catchment area of about 3,500 inhabitants, a value that would ensure fairness of service, both from the point of view of population (ie to ensure that only a small number of inhabitants is served by multiple locations pharmaceutical and that, on the contrary, a part of the population is not served), both from the point of view of competition between the different pharmaceutical locations, which could therefore count on homogeneous catchment area.

In detail, in Castelfranco Emilia there are 3 "urban" pharmacies located in the center of the main town, as well as a fourth location already planned but not yet assigned.

The three existing urban pharmacies, overall, serve a catchment area of about 17,500 inhabitants, of whom about 3,700 have more than 65 years, as follows:

- Bertelli pharmacy: 7.184 inhabitants (widespread houses included), 1.574 aged
- Gulmanelli pharmacy: 6.196 inhabitants (widespread houses included), 1.408 aged
- Le Magnolie pharmacy: 4.050 inhabitants (widespread houses included), 690 aged

The current situation potentially shows a larger catchment area for the first of these, while the fact that Le Magnolie pharmacy has a smaller number of residents related to their district is not really significant, since, being situated within a mall, actually it catches customers coming from other areas of the town and of the surrounding municipalities.

The other three existing pharmacies are located in the surrounding villages instead. The Masini pharmacy, located in Piumazzo, can count on a large catchment area inside its assigned district(it is about 4,900 inhabitants, widespread houses included, of whom more than 1,000 aged); Gubertini pharmacy, located in Manzolino, has a catchment area if nearly 2,700 inhabitants (widespread houses included), of whom about 470 aged; Guarino pharmacy in Gaggio di Piano village has a catchment area of about 2,700 inhabitants (widespread houses included), of whom about 550 aged.

Among the main remaining villages there's La Cavazzona, whose pharmaceutical location has recently been assigned (for a potential catchment area of 2,121 inhabitants, of whom 320 aged).

The other villages and towns in the municipal area are much smaller, and count up to a few hundred inhabitants. Pioppa and Panzano, neighboring villages placed north of the main town, and, if considered together, would arrive to cover about 550 inhabitants.

To fully comply with the goals of the Law, ie to ensure the widest accessibility of pharmacy services also to those citizens living in sparsely populated areas, a new location sited therein could have also been assessed; however, considering the small catchment area that this one would serve, a new pharmaceutical location in that position, would not probably survive.

Therefore, the assessment of a new location within the main town has been considered, however, taking into consideration both the need of the accessibility for these villages, and the need to expand the coverage of the service to outlying areas, rather than to offer alternatives to areas already served within the city center. The location of an additional pharmacy inside the main town has therefore to be carefully assessed in order to identify the most uncovered areas and to avoid, as far as possible, serve closely the central areas, that can already rely on the presence of 3 existing pharmaceutical locations.

Another issue to be analyzed deals with the distance between pharmacies that has not to be lower than 200 meters, that the Law requires to pursue in an equal and widespread distribution of new locations in the municipal area.

## 3.2 ACCESSIBILITY OF PHARMACY SERVICES (GOAL3)

Considering the accessibility of the 6 existing pharmaceutical locations, it appears that virtually almost the whole population (27,410 inhabitants) is served by at least one pharmacy within 2 kilometers, which is about 10 minutes by car, and about a third inhabitants has a pharmacy within 400 meters from home (11,621 inhabitants), ie by a pedestrian walking distance in 6 minutes on average (fig. 4).

In general, then, the municipal territory has a good coverage, but nevertheless it has significant imbalances from area to area. Within a radius of 400 meters from the existing pharmacies around 4,649 inhabitants are served by two pharmacies, reachable in about 6 minutes walking (which is in fact the average time required to complete a distance of 400 meters) and well 3,840 inhabitants have even 3 pharmacies within 400 meters. This redundancy of the service, concentrated in a very small area of the main town, goes instead to the detriment of the 20,481 inhabitants of the town who do not have any pharmaceutical location within walking distance (ie placed within a distance of 400 meters) and are therefore forced to use the car to reach one of the existing locations. The new location could be provided in the most suburban areas and not immediately in the center of the main town, where, besides being in conflict with the potential catching areas of existing pharmacies, it also provide an unnecessary service at the expense, however, of areas that would most benefit from the opening of a new pharmacy. Therefore, it is possible to identify alternative locations that better meet the requirements of the Law and thus ensure a better distribution of the service on the territory, highlighting the distribution of the density of the population in the municipality and in detail in the main town (fig. 4).

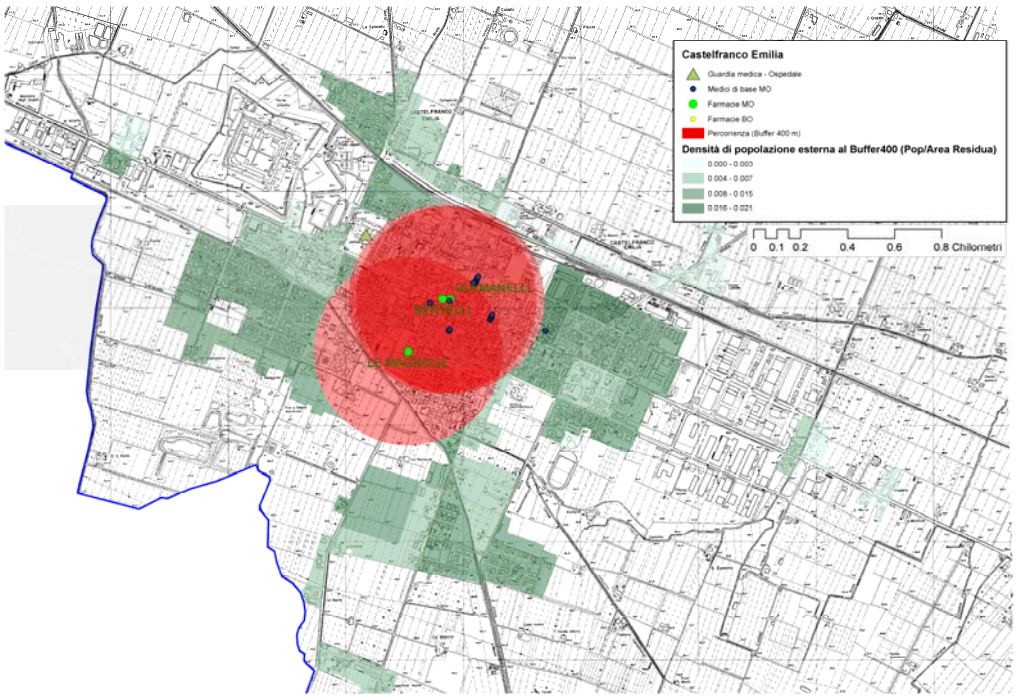
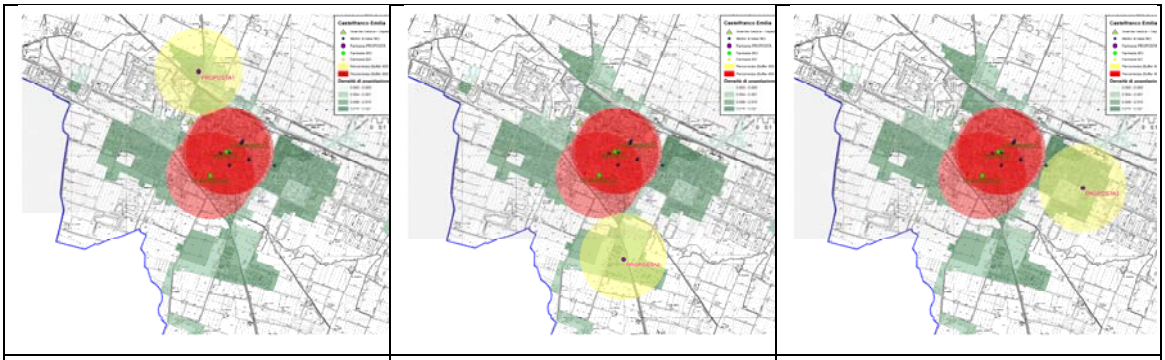



Fig. 4 The distribution of population density in the main town, and 400 meters buffers (red)

Due to the high service coverage in the center, there are also areas with a high population density that are "unserved" within pedestrian accessibility on the edge of the town: these are the east and west parts along the Via Emilia, but also in the northwest, where the Hospital is located, and to the south, where there is a recent urban development.

In summary, from the analysis of these "residual areas", the following 3 cases of location of a new pharmaceutical seat arise:



| 1 | 2 | 3 |
|---|---|---|

The 3 hypothesis intercept the following catchment areas:

| | BUFFER 400 METERS | | BUFFER 2.000 METERS | |
|---|---|---|---|---|
| | **Tot inhabitants** | **Over 65** | **Tot inhabitants** | **Over 65** |
| 1 | 1.530 | 350 | 18.180 | 3.770 |
| 2 | 2.400 | 320 | 18.160 | 3.750 |
| 3 | 2.710 | 657 | 18.400 | 3.810 |

Numerically, the location to the east (hypothesis 3) seems the most useful and helpful; however, it should be noted that the criteria defined by the Law refer to a standard population only to identify the number of new pharmacies to be set up, while their location can not be separated from respect of equal geographical distribution and widespread accessibility to the pharmaceutical service even to those who live in sparsely populated areas.

Based on these criteria, the most suitable location would refer to the hypothesis 1 (north) because it could serve a portion of the main town, separated from the center by the railway line, and so with limited accessibility to the existing pharmacies, and, furthermore, it would intercept within about 2 km also some neighboring villages and widespread houses (Pioppa and Panzano), and then would fully satisfy the goal to provide a service even to sparsely populated areas.

## 4 CONCLUSIONS

As is clear from the carried out analysis, placing a service, such as pharmaceuticals, in an area more than another of the city may significantly affect the potential catching area: it may shift territorial balances, in terms of mobility and utility, and, and the more or less equal distribution of the service, from the point of view of seller, could also generate economic competitiveness.

Thinking in terms of territorial dimensions, the efficiency of the service, seen as widespread distribution of the pharmaceutical locations, is much efficient when it manages to balance spatial and regulatory sustainability with the economic one, so as to obtain a partition of the land allowing just not to penalize anyone but, at the same time, to allow everyone to have a social payback.

The effectiveness of the service, instead intended as the effective reachability of the locations from the inhabitants, is greater if it takes into account both the stratification of age and the effective accessibility of each single pharmacy, considering both paths and physical limits of the territory on these routes. These

aspects obviously can not emerge from a only-regulatory approach, but need to be analyzed by means of spatial tools.

If the liberalization of pharmaceutical locations can lead to an increase in competitiveness for the pharmacies themselves, its territorialization can bring that competitiveness onto a spatial level/dimension and thus it requires the adoption of descriptive parameters, as the population density (from the user's perspective) and territorial/urban accessibility (from the point of view of the service).

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