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Defining the unitary types of urban uses: urban uses, land uses and land-use zones

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It is clear that urban planning is not a theoretical science, but an applied field. However, this does not imply – or justify – the lack of an analytical field that would lay the scientific foundations of urban planning and guide planning practice. This field, which we call *urbanology*, must consist of a theory of urban uses, since the latter constitute the foundation of all international planning practice. As part of the process of formation of this theory, the present paper focuses on defining the unitary types of urban uses, that is, the units which constitute the smallest, not further divisible typological elements of the organisation of urban space. We begin with the definitions of the basic concepts of urbanology, namely: urban use, unitary type of urban use, land use and institutionalised land-use zone. We then attempt to specify the criteria for determining the unitary types of urban uses, which when applied to Greek space leads to the specification of 330 types of urban uses. We also demonstrate that this work does not only concern the analysis of urban space and the survey stage of urban planning, but also planning proposals and legislation.

Keywords: urban survey, inventory, urban use, land use, land-use zones, NACE

The concepts of urbanology and regionology

There is no doubt that urban and regional planning are applied fields. While they may be called ‘applied sciences’, they cannot really be characterised as sciences, given that a science is analytical, that is, its aim is to describe and interpret a given situation, even predict its future course, but not to create a new situation by directly intervening in the physical world. Intervention, however, is the goal of urban and regional planning and thus they are techniques, not sciences. Science attempts to be objective, while techniques are by definition subjective, in the sense that any intervention is guided by ideological goals. Techniques are not *ex nihilo* constructions, but are founded on previous analytical knowledge, provided by sciences, though they also create their own theories and methodologies. They are more complex than sciences, since they may be founded on more than one science, as well as on other techniques.

Apart from urban and regional planning, there are other forms of spatial planning, such as spatial economic planning or ecological planning, which are a hybrid extension of established analytical sciences, economics or ecology in the above examples. We feel that this should also be the case with urban and regional planning. We believe that an ‘urbanology’ and a ‘regionology’, together com-

posing ‘spatiology’,¹ are badly needed and manifestly cannot be other than a theory of uses (functions). A theory of this kind must start with the theoretical construction of the *urban use*, the basic urbanological concept on which is then constructed the concept of land use and, consequently, the whole of contemporary urban planning practice internationally. For this reason, the next section of this paper is devoted to the discussion of the concept of urban use and other related terms. We then introduce the concept of the *unitary type of urban use*, defined as the smallest, not further divisible typological element of the organisation of urban space. In the fourth section, we discuss two concepts generated from the concept of urban use, namely *land use* and *land-use zone*. Since the unitary types of uses constitute the basic unit organising urban space, in the fifth section of the paper we specify the criteria to be used to create a complete catalogue of these unitary types. The application of these criteria to international and Greek data constitutes the sixth section of the paper, the ambition of which is to offer a catalogue of general validity. Finally, in our last section, we acknowledge the historical dynamics of urban uses as social products, but argue that for several reasons the catalogue we propose both presents a certain stability and has the flexibility to accommodate changes. We also try

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¹The term ‘urbanology’ is used today either in a very broad sense covering urban subjects from sociological and political issues to urban planning, or more commonly in a more specific sense as a branch of sociology (cf. urban sociology). The term ‘regionology’, on the other hand, is a neologism, with the exception of a Russian journal which has this term as title and deals with regional economic, social and political problems, as well as regional development. Our definitions correspond to neither of these aspects, since what we are looking for is the *analytical* science, epistemologically defined, *behind* urban and regional planning practice (on spatiology, see Lagopoulos 2018, pp. 3, 5–10).

to demonstrate that it does not only concern the analysis of urban space and the survey stage of urban planning, but also planning proposals and legislation.

The concept of urban use

Before discussing the concept of urban use,² it is useful to distinguish between four closely related terms: spatial social practice, urban and regional activity, land use, and urban and regional function. Contrary to the new geography of the 50s and 60s, for which space was an autonomous entity, there seems to be no doubt today that space cannot be isolated from its social context. Urban and regional space is the projection of society on geographical space, which as an integral part of society interacts with it, creating a socio-geographical whole. Social systems are activated by social processes, produced by the social practices of social subjects. Some of these practices have no implications for space, but others do: these are the *spatial social practices*. They take the form of dynamic urban and regional *activities*, which are different ways of using space.

The term ‘activity’ is preferred by J. Brian McLoughlin, although he also uses the term ‘land use’. He formulates four general systemic elements of space (as a human ecosystem) that he orders into two pairs: the pair of components, namely activities (i.e. urban uses) and the spaces in which they are located (their physical counterpart), and the pair of their connections, namely human communications (between activities) and their channels (their physical counterpart). The four elements of his system are thus founded on a theoretical conception of activities, that is, urban uses, making it clear that his approach is based on a theory of urban uses (McLoughlin 1969, 34, pp. 77–79).

This dynamic activity of using space, that is, the use of space, results in a determined spatial quality. This is an urban *use* from the point of view of the subject of the use (a use of space by a subject), but it is an urban or regional *function* from the point of view of the response of space to the action of the subject (a function of space due to the action of a subject) (Lagopoulos 1994, pp. 128–129, 141).

The concept of urban (or regional) use³ is immediately perceptible and understood, even by the non-specialist, because it has its source in the way we perceive space. Warehouses and workshops, grocery stores, offices, cafés and hotels, schools, residential buildings, sports installations and green spaces are only some of the many different uses which we encounter in contemporary urban space. However, although the concept of use may be easily understood empirically, this does not abrogate the need for a theoretical definition of its content. We define as an *urban use* the *effect of any social activity that acquires a geographical manifestation in urban space*. When the land use is spatially manifested, it *results in the occupation of a spatial location* (i.e. it is localised) and fulfils the following conditions: (a) is a *legal entity*, (b) has a *unified internal functional and administrative organisation* and

(c) has a *stationary material structure which serves as its vehicle* (Lagopoulos 1994, p. 134).

The condition of being a legal entity is fundamental for the definition of a use, since the recognition of a use by the legal system stresses its *social orientation* and confirms its importance for the functioning of society. In addition, the legal recognition of a use implies that the use is *repetitive*, that is, it is subject to a certain level of standardisation, which confirms its existence as a distinct and autonomous unit of the legal and social system. Indeed, the stabilisation of the social orientation of a use, on the one hand, and the consequent consolidation of its functional, administrative, even morphological characteristics, on the other, are mutually linked processes which take place simultaneously. Finally, the criterion of legal recognition is basic in order to distinguish urban uses from other localised human uses which cover individual, but not social, needs, such as for example the activity of sleeping inside a residence.

Indeed, an urban use may be further subdivided in the context of other fields, such as for example architecture, for which a single urban use is divisible into distinct architectural uses (Lagopoulos 1994, pp. 133–134). This is why the second criterion, that of a unified internal functional organisation, allows us to treat a set of separate architectural uses as a single functional unit, which is perceived as an urban use. This criterion is crucial for the comprehension of the internal homogeneity of a use and its (relative) autonomy in urban space.

A unified internal organisation does not necessarily imply functional homogeneity. An urban use may be composed of heterogeneous uses, each one of which may also appear autonomously in urban space and thus constitute a distinct urban use. For example, offices may be found either autonomously, in which case they constitute the distinct urban use ‘offices’, or as part of the set of activities that together constitute an industry. In the latter case, where we have a cluster of different uses (such as the production line, the accounting office, display rooms, warehouses, a cafeteria) but with a single functional and administrative structure, the nature of the urban use is determined by the dominant use which gave birth to and activates the remaining ancillary uses. It is obvious that in the above case, the production line constitutes the original cause and activating force behind the ancillary uses, and for that reason, the cluster is defined as the urban use ‘manufacture’. The dominant use of such a cluster usually dominates it spatially as well, by occupying the largest floor space.

In every case, the existence of a unified internal organisation is reflected in the material structure which supports and serves the use. This material structure usually takes the form of a built space (shell) which shelters the activity, but it may be limited to a technically simple construction which does not shelter the use but simply serves as its vehicle, being necessary for its functioning (e.g. the flat surface of a playing field or the bleachers surrounding it). We should clarify that the link between a use and the vehicle that supports it must be structural, not coincidental, since a use is a characteristic of an object and that object is constructed as such because it is the vehicle of a use (Lagopoulos 1994, p. 133). Of course, there may be borderline cases, such as the stalls of a weekly farmer’s market, but these do not alter the general rule that a use and its vehicle are structurally linked. Indeed, the link

²For this concept and the other main concepts discussed in the present and the following two sections, see also Lagopoulos (2018, pp. 9–10).

³The concept of urban use coincides with that of regional use, since there is no break in continuity between urban and regional planning. For the sake of simplicity, the present paper uses the term urban use, though we do not mean to imply that the concept cannot be equally well applied in a regional approach to uses.

between use and material vehicle is the starting point for the discussion of the social semiotics of urban uses (Lagopoulos 1994, pp. 157–164).

Our reference to the material structure is significant for two reasons. First, for the obvious reason that the spatial existence of a use is defined by the surface delineated by the physical limits of its material structure, and thus it is the existence of the latter which allows us to measure the surface area which the use occupies. Second, the differentiation of uses leads to a certain degree of spatial differentiation between them. This spatial differentiation, which is easily perceptible empirically, allows the researcher to distinguish the different uses and their spatial autonomy.

The concept of the unitary type of urban use

An urban use is an element of the empirical world. In contrast, the *unitary type of urban use* is a theoretical concept (the result of a process of abstraction based on empirical data) which refers to the *smallest, not-further-divisible organising element of urban space*. For example, let us say that we define as ‘retail trade in clothing’ the retail trade in clothes, furs, and accessories such as gloves, ties, suspenders, etc. It is empirically certain that in urban space we encounter shops which sell all, some, or only one of the above gamut of products. However, the high *degree of functional similarity* of these shops allows us to group them together in the set of ‘shops of the retail trade in clothing’, leading to the construction of the corresponding unitary type of urban use. As we can see, the degree of relationship or degree of similarity between the urban uses constitutes the basic criterion for the definition of the unitary types, and at the same time allows us to differentiate between them. The degree of similarity between urban uses is determined by having recourse to the concept of the *nature of the use*, which also reflects the kind and variety of goods or services which a particular use produces, sells or offers (partial criteria which we will discuss below). We should be careful to differentiate between the theoretical typological concept of the unitary *type* of urban use as a set and the individual *token* that corresponds to the smallest designated element in actual, empirical urban space, the single localised urban use, for example, ‘Arcadia Meat Market’.

The unitary types of urban uses correspond to sets of actual uses which are closely related to each other, and constitute the indispensable basis of urban planning classification. However, the unitary types are so specialised that in most cases of the analysis of urban space we need to use larger groupings of uses. The process of defining the latter is directly related to the topic of the present paper. To be specific, with the classification of the urban uses, on the basis of a catalogue of the unitary types, we can construct a tree diagram of wider functional groups. The number and contents of these groups are sometimes in practice determined by the researcher, according to the goals of each separate study, although in common planning practice the groups develop gradually, that is, through the modification of some earlier study. This process leads to a sort of stabilisation of their basic structure, which however remains empirically determined. There is, then, a need for a theoretical approach to the issue, an approach which will, of course, take into account what has been achieved empirically. However, although the

question of the classification of the unitary types of urban uses is of crucial practical and theoretical significance for urban analysis and planning, it is an issue beyond the scope of the present paper (but see Pissourios and Lagopoulos 2017).

The concepts of land use and institutionalised land-use zone

The term *land use* is used both in urban and non-urban (rural) space to refer to the dominant use of a plot of land, covering two separate but interrelated concepts: the theoretical understanding of this phenomenon as an element of the theory of urban planning, and its actual *projection* onto urban space, that is, its *location*. For example, the land use of a plot where an industry is located is defined as industrial land use. If, on a parcel of land which by some criterion has been characterised as a unit, more than one urban use is located (a very common case in urban space), then the land use of that parcel is determined by the *dominant* urban use, or possibly uses, located on it. For example, if in an area dominated by housing, there are also some commercial uses and schools, the land use of the area is defined as housing. The criterion determining the dominant use is the area occupied by the various uses; this is the most common, but not the only criterion, of dominance (for a more detailed presentation of the method for determining land uses, see Lagopoulos *et al.* 2009).

At the same time, the concept of land use is also used by planning legislation, that is, it is a technical legal term used to refer to the specification of a set of urban uses which are legally allowed (and as a result other uses are prohibited) in a particular urban zone. This zone, which has a legal and regulatory character, is the *institutionalised land-use zone*.

Greek planning legislation specifies a number of such institutionalised zones (Official Government Gazette, Presidential Decree 166/D/6.3.1987), which the planner is required to use in order to regulate urban development. It defines nine institutionalised land-use zones, which the Official Government Gazette, unfortunately, calls ‘general urban functions’ (Table 1). In each of these zones, only certain urban uses – called ‘specific urban functions’ – can be located, and these uses determine the character of the zones (Table 2).

It is obvious that in Table 2, the specific urban functions are presented in the form of an empirical listing of uses in a one-dimensional catalogue, instead of a theoretically consistent hierarchical classification. The result is a quite problematic confusion, with inappropriate and heterogeneous elements presented linearly and empirically in arbitrary order:

- Unclear terminology (e.g. in function 9, what is meant by ‘tourist installations’: marinas, which belong in transportation? souvenir shops, which belong in retail trade?);
- Over-analytical unitary or sub-unitary types of uses unrelated to wider categories (e.g. function 2, ‘Small hostels’, function 6, ‘Restaurants’, function 7, ‘Coffee shops’, function 20, ‘Petrol stations and natural gas suppliers’);
- Overlapping types (e.g. function 5, ‘Administration’ belongs in function 4, ‘Offices’, while the theatres and cinemas of function 10 are cultural installations,

which have their own category in function 11, or leisure activities, which do not exist as a separate category);

- Confusion of part and whole (e.g. in function 4, 'banks, insurance companies, public services' are all 'offices' – which is separately listed, also in 4);
- Unclear classifications (e.g. in functions 10, 11, 14, 25, 27: 'etc.');
- Incomplete classifications (e.g. the offices, banks, insurance companies and public services of function 4 are only part of a long list of types of offices, such as stock exchanges, pawn shops, travel agents); and, finally,
- Related types given widely separate function numbers (e.g. 'Warehouses and storage spaces' are listed as 18, while 'Wholesale trade' as 21).

The lack of systematic classification is confirmed when the same Official Government Gazette attempts to specify the contents of the general urban functions and discovers that some specific urban functions have to be divided into more detailed sets of uses. For example, to specify the character of the 'purely residential' zone, the lawmaker had to further divide the specific urban function of commercial shops, so that the general urban function of 'purely residential' could include only those commercial shops which serve the daily needs of the inhabitants. Of course, although it became necessary to divide the specific urban use of commercial shops into daily, occasional and infrequent retail trade, this fact did not, unfortunately, lead to a revision and completion of the function in Table 2.

It is evident that an exhaustive catalogue of the unitary types of urban uses, which would then serve to define the specific urban functions, would solve all the problems discussed above. It is this gap which the present paper attempts to cover.

Criteria for defining the unitary types of urban uses

As we mentioned above, the unitary types of urban uses constitute the smallest, not-further-divisible elements of urban space. Examples of unitary types, such as the grocery shop, the barber shop, the tire shop and the tannery, make up a list of uses which reminds us that this nomenclature constitutes the starting point for a definition of the unitary types. The nomenclature of the uses is linked to their historicity, in other words to their origin (in stable social practices) and to the ascription of a particular

Table 1 General urban functions, according to the planning legislation in force (Official Government Gazette 166/D/6 March 1987)

1. Purely residential
2. General residential
3. Urban centres – central urban functions – local neighbourhood centre
4. Non-polluting industry and small industry, industrial and manufacturing park (low to medium degree of pollution)
5. Polluting industry and small industry (high degree of pollution)
6. Wholesale trade
7. Tourism and leisure
8. Open spaces and urban green spaces
9. Public services

name, marking them as recognisable units of social and urban space.

Such an onomasiological approach to the definition of the unitary types does not mean that they cannot be defined through the use of more analytical criteria. Generally speaking, the definition of the unitary types is based on the exploration of the similarities and differences which exist between urban uses. These similarities and differences can be found: (a) *in the nature of the activity being carried out* (McLoughlin 1969, p. 39), that is, in the last analysis, in the nature of the use, and (b) more specifically, *in the kind and variety of the goods or services produced, sold or offered by it*.

The differentiation of the nature of the use, that is, the parallel differentiation of the activity which takes place in that space and which corresponds to a specific social practice, is the primary criterion for the differentiation of the unitary types. In any case, the uses are social practices before they are localised and transformed into urban uses (Lagopoulos 1994, p. 141) and the separation of uses into manufacture, trade, services, etc. depends on the differentiation of those social practices. The criterion of the nature of the use is the most crucial criterion for defining the unitary types, since each differentiation in the nature of the use leads necessarily to the creation of distinct typologies and ultimately to distinct unitary types of uses.

Table 2 Specific urban functions, according to the planning legislation in force (Official Government Gazette 166/D/6 March 1987)

1. Housing
2. Small hostels (around 20 beds)
3. Commercial shops, shops offering personal services
4. Offices, banks, insurance companies and public services
5. Administration
6. Restaurants
7. Coffee shops
8. Nightclubs and leisure installations
9. Hotels and other tourist installations
10. Places of public assembly (theatres, cinemas, conference halls, etc.)
11. Cultural buildings and cultural installations in general (libraries, exhibition halls, etc.)
12. Educational buildings
 - Elementary education
 - Secondary education
 - Tertiary education
 - Special education
13. Religious spaces
14. Social services (health centres, daycare centres, retirement homes, etc.)
15. Medical buildings (hospitals and clinics)
16. Industrial buildings (low, medium, high pollution level)
17. a) Small industry (low, medium, high pollution level)
b) Professional workshops (low, medium, high pollution level)
18. Warehouses and storage spaces
19. Parking garages and parking lots
20. Petrol stations and natural gas suppliers
21. Wholesale trade
22. Farming, forestry, animal husbandry, fishing and other agricultural uses
23. Commercial exhibition spaces
24. Sports installations
25. Open public spaces (squares, parks, groves, streets, playgrounds, etc.)
26. Public transportation installations
27. Other specific uses (military installations, cemeteries, etc.)

At the same time, of course, there are social sub-practices (such as eating or sleeping) which lead to the formation of architectural uses (e.g. the kitchen, the dining room or the bedroom) in the interior of an urban use. Urban uses, as units, rarely enclose only a single architectural use. Usually an urban use is composed of a set of architectural uses, of which one is dominant and the rest secondary or ancillary to the main use. In cases where the dominant architectural use is common to two urban uses, interest focuses on the secondary architectural uses in order to determine if their differences are such as to justify the classification of the two urban uses in separate unitary types. In addition, different urban uses can be distinguished by the ratio of the space devoted to the partial uses which compose them. For example, although the provision of accommodations is the dominant activity of both hotels and motels, motels usually have smaller spaces for dining, leisure activities and retail trade and larger parking areas than hotels, and may also include uses which are not included in hotels, such as petrol stations. In other words, although these two urban uses have the same dominant use and have most of their ancillary uses in common, the existence of certain differences in the set of ancillary uses, and mainly the different ratios of space devoted to the latter, leads to their definition as two distinct unitary types of urban uses.

There is also a group of criteria for the definition of the unitary types that follows from the kind and variety of goods or services which are produced, sold or offered to the customers of a use. The first sub-criterion, the kind of goods or services offered, is the basis for the distinction between a pharmacy and a grocery store, since the nature of their activity (retail trade) is the same in both cases. The second sub-criterion, the variety of goods or services offered, is the basis for the distinction between a grocery store and a supermarket, since the first is limited to retail trade in food and drink, while the second has a larger variety of goods for sale, from food and drink to household goods, clothing, footwear, and small electrical and electronic appliances.

At this point, we need to note that the application of these criteria for the definition of the unitary types does not lead to a single set of such types, but to a number of variants, until we arrive at a matrix which satisfies to the highest possible degree the combination of theoretical criteria and empirical requirements. The unitary types, like the unitary elements of any science, are nothing but discontinuous concepts which divide up the continuum of reality. The sections of this division correspond to concepts, which refer to groups or categories of relatively similar objects or events. The division may lead to a large population of unitary elements, where every element shows a high degree of internal consistency and at the same time there are only minor differences between the elements, or it may lead to a smaller population of elements, where each element shows a lesser degree of internal homogeneity and there are pronounced differences between the elements.

The above process, in urban planning as in other fields, must not be understood as an abstract theoretical process during which the particular preferences and choices of each researcher are what determines the size of the sections of the division. The division and the unitary elements which result from it need to correspond to sections of reality which by common agreement show a

certain autonomy, that is, are both founded in material social practices and perceived semiotically by the society as distinct units. For this reason, the measure used in the division and creation of unitary types must be consistent with the existing onomasiology of the uses (grocery store, barber shop, tire shop, tannery, etc.), since the acquisition of a particular name implies the recognition of a degree of commonly accepted autonomy of the object named. In conclusion, because of the *de facto* link between the proposed unitary types and reality, the influence of each individual researcher on the definition of the unitary types is insignificant, limited as it is to minor differences.

A catalogue of the unitary types of urban uses

So far, there has been no exhaustive catalogue of the unitary types of urban uses, in Greece or internationally. However, there are several exhaustive catalogues of the unitary types of economic activities, such as for example the various editions of NACE, the statistical classification of economic activities in the European Community, the most recent edition being NACE Rev. 2 (Eurostat 2008). The unitary types of economic activities are of particular interest to the present paper, since they have important similarities with the unitary types of urban uses (Lagopoulos 1994, p. 135, 2009, p. 149): there is a close relationship between the economic and the urban planning point of view on the definition of unitary types, because 'the close relationship between use value and exchange value in capitalism leads to a tendency for the unitary elements of urban analysis and economic analysis to coincide; a tendency which, however, is not absolute' (Lagopoulos 1994, p. 135). In practice, their relationship derives from the fact that the interest of both urban planning and economics focuses on the definition of the nature of the activity carried out in the particular geographic space occupied by each use. For the definition of economic activities, the uses to which the goods and services are put and the inputs, the process and the technology of production are also taken into account (Eurostat 2008, p. 21), criteria which do not interest urban planning.

Because it is necessary for the catalogue of the unitary types of uses to be exhaustive, the only systematic and holistic point of departure available to the researcher is the NACE classification. However, because of the differences between the unitary types of urban uses and the unitary types of economic activities, we need to make a systematic conversion of the latter to the former, a process which, as we shall see below, leads to important partial differences between the two classifications, in spite of their basic relationship. For this process, we used NACE Rev. 2, which includes 615 unitary types of economic activities. It is a classification system built on the basis of four hierarchical levels, the lowest level of which, corresponding to our catalogue of unitary types, consists of four-digit numerical codes (classes).

Beyond this source, with its inherent limitation that it only concerns *economic* activities, the international corpus that we consulted includes two other broad sources. The first is Greek legislation, urban planning legislation and legislation concerning individual uses, both of which are discussed in this paper, as well as Greek studies

on the nature and indicators of urban uses. The second source, urban planning standards, has a *normative* character, but prescribes entities of the same nature as those identified by the analytical approach. In this context, we examined the urban planning legislation and development plans of a number of countries and regions, more specifically Greece (see Ministry of Regional Planning, the Settlement and the Environment 1983, Official Government Gazette 1987, National Cadastre and Mapping Agency S.A. 2003); Great Britain (see Core Strategy Studies, e.g. Manchester City Council 2012); Italy (see the *rapporti massimi* – maximum relations – in the Decreto Interministeriale 1444/2.4.1968); Germany (on the basis of the *Flächennutzungsplan* – Preliminary Land-use Plan – of certain municipalities, e.g. Stadt Plauen Fachgebiet Stadtplanung 2010); California (on the basis of the Sacramento General Plan, e.g. City of Sacramento 2015); and Hong Kong (Planning Department 2017).⁴ Such a comparative and comprehensive study, to our knowledge, has not been undertaken before.

In the conversion of the 615 numerical codes of economic activities of NACE Rev. 2, we encountered five different cases: (a) direct correspondence of the code with a unitary type of urban use; (b) subdivision of the code into more than one unitary type; (c) consolidation of codes before correspondence with a unitary type; (d) deletion of some codes, since no correspondence could be found to any urban use and (e) addition of unitary types which do not appear in NACE Rev. 2.

The process of translating the four-digit numerical codes of economic activities into unitary types of urban uses revealed that direct correspondence between a four-digit code and a unitary type was possible in only a minority of cases. As for the subdivision of a code, a characteristic example of an extremely general economic activity (from the planning point of view) is NACE code 93.11, which covers everything from football stadiums to tennis courts and from car racetracks to golf courses, and which for planning purposes had to be analysed into 13 different unitary types of uses. On the other hand, the economic sector of wholesale trade is exceptionally specialised from the planning point of view, since for economic purposes it is organised into 48 unitary types, while the planning point of view needs to distinguish only 6. A similar case is the manufacturing sector.

In some cases, both the subdivision of a four-digit code into partial economic activities, and the combination of one of these with one or more different four-digit codes of economic activities, were necessary in order to create a correspondence with a single unitary type of urban use. For example, the unitary type of use ‘Retail sale of telecommunications equipment and services in specialised stores’ includes all of NACE code 47.42, ‘Retail sale of telecommunications equipment in specialised stores’, together with part of code 61.90, ‘Other telecommunications activities’, which relates to the provision of telecommunications services and to the activities of telecommunications resellers.

⁴See analytically on the above (Pissourios 2010, pp. 345–396, 2012, 2015). The theoretical background for the selection of the countries of the EU was Peter Newman and Andy Thornley’s (1996, pp. 28–35) typology of the legal-administrative regions of Europe. They distinguish four such families in the EU: the British, the Napoleonic (whence our selection of Greece and Italy), the Germanic and the Scandinavian.

In addition, a significant number of unitary types of economic activity do not correspond to any unitary type of urban use, since they refer to activities which either are not permanently connected to the space where they take place, or are secondary and for that reason included in other uses. For example, NACE code 01.6, ‘Support activities to agriculture and post-harvest crop activities’, includes activities incidental to agricultural production (e.g. trimming of fruit trees), as well as post-harvest crop activities (e.g. preparation of fields), in other words, occasional or ancillary activities which are covered by the dominant activity. Another example is fishing (code 03.1), which is certainly an economic activity, but which is not limited to a specific space and thus cannot be listed as an urban use, in contrast, for example, to aquaculture (code 03.2), which is spatially located and can thus constitute a unitary type of use. The 25 four-digit codes of NACE Rev. 2 which were not used to define unitary types of urban uses appear in Table 3.

Finally, 24 unitary types were added which do not correspond to any codes in NACE Rev. 2, since either they are not economic activities (e.g. residences, prisons and playgrounds), or they have not been added to the classification (e.g. schools of martial arts). These 24 types are listed below, with in parenthesis their number in Table 4: fishing wharf (12), public toilets (78), customs houses (89), coffee roaster: retail sale of coffee and dried fruits in specialised stores (108), retail sale of organic food products in specialised stores (111), locksmith: retail sale of padlocks, locks, keys, hinges and the like; provision of key duplication services (129), retail sale of electrical wiring and fittings and other electrical equipment (130), retail sale of plumbing and heating equipment (131), retail sale of scale models, arts and crafts equipment and materials (140), sex shop: retail trade of sex products (141), brothels and escort services (166), patisseries, pastry shops and donut shops: provision of confectioneries to seated customers (203), fun parks for children (206), local administration offices (216), conference centres (286), exhibition halls, showrooms and trade shows (287), cemeteries and memorial parks (291), refugee camps (301), prisons (308), housing (323), urban greenery (326), playgrounds (327), urban squares (328) and neighbourhood parks and open green spaces (329). The final results of the above process is shown in Table 4, which lists the 330 unitary types of urban uses which we identified.

Although the definition of the unitary types and their correspondence to the NACE codes of economic activity was generally clear, in some cases the definition of the unitary types required additional research and bibliography to allow a greater depth of analysis. These cases, which concerned shops selling food, drink and/or sweets to seated or non-seated customers, hotels, sports installations and green spaces, were drawn from Greek legislation and the other sources of our corpus referred to above, and are discussed below.

The shops selling food, drink and/or sweets to seated or non-seated customers were organised into five unitary types of urban uses. This definition was based on a Greek source (see Official Government Gazette, Ministerial Decree 526/B/24.9.1983) where according to the activity taking place they are divided into: (a) shops selling drinks, without food, to seated customers, which includes traditional and modern cafés, bars and beach bars (our code 201); (b) shops which prepare and/or

Table 3 Economic activities included in NACE Rev.2 which were not used in the definition of the unitary types of urban uses

NACE Rev.2 Code	Number of four-digit numerical codes included	Description of the economic activity
01.5	1	Mixed farming
01.6	4	Support activities to agriculture and post-harvest crop activities
01.7	1	Hunting, trapping and related service activities
02.3	1	Gathering of wild growing non-wood products
02.4	1	Support services to forestry
03.1	2	Fishing
09	2	Mining support service activities
33.2	1	Installation of industrial machinery and equipment
49.1	1	Passenger rail transport, interurban
49.2	1	Freight rail transport
49.31	1	Urban and suburban passenger land transport
52.24	1	Cargo handling
47.91	1	Retail sale via mail order houses or via Internet
47.99	1	Other retail sale not in stores, stalls or markets
62.03	1	Computer facilities management activities
77.4	1	Leasing of intellectual property and similar products, except copyrighted works
88.1	1	Social work activities without accommodations for the elderly and disabled
97	1	Activities of households as employers of domestic personnel
98	2	Undifferentiated goods and services producing activities of private households for own use

serve food, with or without accompanying drinks, to seated customers, such as restaurants, fish taverns, grill houses, pizza restaurants, snack bars and dining clubs (code 202); (c) shops which prepare and serve sweets and all kinds of dairy products to seated customers, such as patisseries, milk bars, pastry shops and donut shops (code 203); (d) shops selling food and drink for immediate consumption to non-seated customers, such as street food stalls, canteens and coffee shops (code 204) and (e) night clubs (code 205).

Another special case concerns the definition of the unitary type of hotels, since hotels are complex uses which serve and offer a wide variety of different activities, among which the provision of accommodations is primary, followed by leisure. The various functional and architectural types of hotels (classical hotels, motels, furnished rooms and classical hotels with furnished apartments, see Official Government Gazette, Presidential Decree 43/A/7.3.2002) provide these two dominant uses in different combinations, further differentiated by the rating ('stars') of the hotel. Although the provision of accommodations always remains the dominant activity

in all the functional and architectural types of hotels, they vary significantly in their provision of recreational activities. As a result, two unitary types were created to allow for differentiation between hotels where the provision of recreational activities constitutes a significant part of their services, and other hotels where recreational services are limited. This distinction was made on the basis of the functional and architectural type to which the hotel belongs and the number of stars in its rating. The number of stars a hotel has plays an important part in the distinction, since a rating of a certain number of stars requires a hotel to satisfy specific technical specifications and provide particular services to its customers (see the above Official Government Gazette). Generally speaking, the more stars the hotel has, the more services it is required to offer its guests, and thus, the more recreational activities it provides.

Specifically, according to the Official Government Gazette, classical hotels must have at least 10 rooms with or without private bath, common areas for the reception, meeting, dining and recreation of its customers, and service areas, on the basis of which they are classified into categories of one to five stars. Motels must have at least ten bedrooms with private bath and the same architectural uses as above; they are designed primarily for customers travelling by automobile, and for this reason are required to provide one parking space for each room and parking spaces for tourist buses, as well as petrol stations; they are classified into three-star and four-star categories. Hotels of the type 'furnished rooms' provide apartments of one, two or more main rooms with complete bath and small kitchen area and the same architectural uses as above; they are classified into categories of one to five stars. Hotels of the type 'classical hotels with furnished apartments' (hotels of mixed type) have rooms with bath and/or apartments of one, two or more main rooms with complete bath and small kitchen area, and the same architectural uses as above, and in addition shops for the convenience of their customers. Hotels of the mixed type must have at least 300 beds and are classified as four-star or five-star.

When we combine the requirements for each of the above types of hotels with the requirements for the various categories of stars, we find that in five-star classical hotels, in four- or five-star hotels of the type 'furnished rooms' with more than 300 beds, and in classical hotels with furnished apartments of whatever star rating, recreational activities make up a significant part of the services offered by the hotel. In the other hotels, that is, classical hotels of four stars or less, motels of whatever star rating, and hotels with furnished rooms with fewer than 300 beds and four stars or less, recreational services are limited. On the basis of the above, we created the two unitary types below:

(a) Hotels, motels and hostels providing short-term accommodations (code 196), including: classical hotels with less than four stars, motels independently of their star rating, and hotels of the type 'furnished rooms' with fewer than 300 beds and four stars or less.

(b) Hotels providing accommodations and recreation (code 197), including: five-star classical hotels, hotels of the type 'furnished rooms' with more than 300 beds and a four- or five-star rating, and classical hotels with furnished apartments independently of their star rating.

Table 4 The unitary types of urban uses and their relation to the code numbers of NACE Rev.2

	Unitary types of urban uses	NACE Rev.2 codes
1	Cultivation of cereals, rice, leguminous crops, oil seeds and other non-perennial crops in open fields	01.11, 01.12, 01.14–01.19
2	Cultivation of vegetables, roots, tubers in open fields	01.13
3	Cultivation of non-perennial crops in greenhouses	01.13
4	Cultivation of perennial crops in open fields	01.2
5	Plant nurseries	01.3
6	Animal husbandry	01.41–01.46, 01.49
7	Poultry farming	01.47, 01.49
8	Apiculture and production of honey and beeswax	01.49
9	Sericulture and raising of other insects	01.49
10	Slaughterhouses	10.1
11	Forestry and logging in planted forest	02.1, 02.2
12	Fishing wharf	No code
13	Aquaculture facilities	03.2
14	Mining of solid, liquid or gas minerals	05.1, 05.2, 06.1, 06.2, 07.1, 07.2
15	Quarrying	08.1, 08.91, 08.92, 08.93, 08.99
16	Salt production by evaporation of sea water or other saline waters	08.93
17	Production and transmission of electricity	35.11, 35.12
18	Production of natural gas	35.21
19	Production and distribution of steam and hot water	35.30
20	Manufacture of coke and refined petroleum products	19
21	Manufacture of wood and wooden raw materials	16.1, 16.21, 16.24
22	Manufacture of paper	17.11, 17.12
23	Manufacture of basic metals	24
24	Manufacture of basic chemicals and plastics in primary form	20.1
25	Manufacture of non-metallic structural raw materials	23.2, 23.5, 23.6, 23.7, 23.99
26	Manufacture of wooden structural raw materials	16.22, 16.23
27	Manufacturing of non-metallic building and construction products	23.11, 23.12, 23.14, 23.3, 23.41–23.43
28	Manufacturing of structural metal products	25.1
29	Manufacture of furniture	31.01, 31.02, 31.09
30	Manufacture of wooden products	16.29
31	Manufacture of paper products	17.2
32	Manufacture of rubber and plastic products	22
33	Manufacture of glass and ceramic products	23.13, 23.19, 23.44, 23.49, 23.91
34	Manufacture of fabricated metal products other than machinery and equipment	25.2, 25.3, 25.5–25.9
35	Manufacture of machinery and equipment	28
36	Manufacture of weapons and ammunition	25.4
37	Manufacture of textiles	13.1, 13.2, 13.3, 13.91, 13.92, 13.94–13.99
38	Manufacture of carpets and rugs	13.93
39	Tanning and dressing of leather; dressing and dyeing of fur	15.11
40	Manufacture of leather and fur apparel	14.11, 14.2, 15.12, 15.20
41	Manufacture of apparel other than fur and leather apparel	14.12–14.19, 14.3
42	Production of olive oil	10.41
43	Flour mill	10.61
44	Production and distilling of grape must	11.02
45	Manufacture of food products, beverages and tobacco products	10, 11, 12
46	Manufacture of chemicals and chemical products	20.2, 20.3, 20.5, 20.6
47	Manufacture of basic pharmaceutical and cosmetic chemical products	20.4, 21
48	Manufacture of bicycles and invalid carriages	30.92, 30.99
49	Manufacture of motorcycles, motor vehicles, trailers and semi-trailers	29, 30.91
50	Manufacture of railway locomotives and rolling stock	30.2
51	Building of ships and boats	30.1
52	Manufacture of aircraft, spacecraft and related machinery	30.3
53	Repair of ships, boats, aircrafts, spacecrafts, locomotives and of other transport equipment	33.15–33.17
54	Manufacture of military fighting vehicles	30.4
55	Manufacture of electrical products	27
56	Manufacture of computer and electronic products	26.1–26.4, 26.51, 26.6, 26.7
57	Manufacture of optical instruments and photographic equipment	26.7
58	Manufacture of magnetic and optical media	26.8
59	Printing and service activities related to printing	18.1
60	Reproduction of recorded media	18.2
61	Manufacture of mattresses	31.03
62	Manufacture of jewellery, bijouterie and related articles	32.1
63	Manufacture of watches and clocks	26.52
64	Manufacture of musical instruments	32.2
65	Manufacture of games and toys	32.4
66	Manufacture of medical and dental instruments and supplies	32.5
67	Manufacture of sports goods	32.3

(Continued)

Table 4 Continued.

	Unitary types of urban uses	NACE Rev.2 codes
68	Materials recovery	38.3
69	Manufacturing n.e.c.	32.9, 82.92
70	Infrastructure related to distribution of fuels and other products through mains	35.22, 49.52
71	Infrastructure related to distribution of electricity	35.13
72	Infrastructure related to water collection, treatment and supply	36
73	Infrastructure related to waste treatment and disposal	38.2
74	Infrastructure related to television, radio and data broadcasting and other telecommunication activities	60, 61
75	Railroad infrastructure, other than terminal facilities	52.21
76	Water transport infrastructure, other than terminal facilities	52.22
77	Air transport infrastructure, other than terminal facilities	52.23
78	Public toilets	No code
79	Railway passenger terminal facilities	52.21
80	Port passenger terminal facilities	52.22
81	Air transport passenger terminal facilities	52.23
82	Bus passenger terminal facilities	52.21
83	Terminal facilities of other land transport passengers	49.39
84	Taxi operation facilities	49.32
85	Road freight terminal facilities	52.21
86	Rail freight terminal facilities	52.21
87	Port freight terminal facilities	52.22
88	Air freight terminal facilities	52.23
89	Custom houses	No code
90	Postal and courier activities	53
91	Car parking facilities	52.21
92	Marinas	93.29
93	Wholesale of agricultural raw materials and live animals	46.2
94	Wholesale of food, beverages and tobacco	46.3
95	Wholesale of personal and household goods	46.41, 46.42, 46.44–46.49
96	Wholesale of electrical, electronic and communication products	46.43, 46.5
97	Wholesale of machinery	46.6
98	Other wholesale	45.31, 46.7, 46.9
99	Warehousing and storage	52.1
100	Grocery shop: Retail sale in small non-specialised stores with food, beverages or tobacco predominating	47.11
101	Super market: Retail sale in large non-specialised stores with food, beverages or tobacco predominating	47.11
102	Greengrocery: Retail sale of fruit and vegetables in specialised stores	47.21
103	Butcher's shop: Retail sale of meat and meat products in specialised stores	47.22
104	Fish shop: Retail sale of fish, crustaceans and molluscs in specialised stores	47.23
105	Bakery: Retail sale mainly of bread and secondarily of cakes and pastries in specialised stores	47.24
106	Patisserie: Retail sale of cakes and pastries in specialised stores	47.24
107	Liquor store: Retail sale of alcoholic beverages in specialised stores	47.25
108	Coffee roastery: Retail sale of coffee and dried fruits in specialised stores	No code
109	Tobacco shop: Retail sale of tobacco products in specialised stores	47.26
110	Retail sale of dairy products and other food products in specialised stores	47.29
111	Retail sale of organic food products in specialised stores	No code
112	Retail sale of cosmetics and toilet articles in specialised stores	47.75
113	Pharmacy	47.73
114	Stationery shop: Retail sale of stationery in specialised stores	47.62
115	Petrol station: Retail sale of automotive fuel in specialised stores	47.3
116	Retail sale of clothing in specialised stores	47.71
117	Retail sale of footwear in specialised stores	47.72
118	Retail sale of leather clothing, footwear and other leather goods in specialised stores	47.72
119	Retail sale of sporting equipment in specialised stores	47.64
120	Retail trade of optical goods and activities of opticians	47.78
121	Bookstore: Retail sale of books in specialised stores	47.61
122	Retail sale of music and video recordings in specialised stores	47.63
123	Retail sale of computers, peripheral units and software in specialised stores	47.41
124	Retail sale of telecommunications equipment and services in specialised stores	47.42, 61.90
125	Department store: Retail sale in department stores of apparel, furniture, appliances, hardware, cosmetics, etc.	47.19
126	Toy store: Retail sale of games and toys in specialised stores	47.65
127	Retail sale of furniture, lighting equipment and other household articles in specialised stores	47.59
128	Florist: Retail sale of flowers, plants, seeds and fertilisers in specialised stores	47.76

(Continued)

Table 4 Continued.

	Unitary types of urban uses	NACE Rev.2 codes
129	Locksmith: Retail trade of padlocks, locks, keys, hinges and the like; provision of key duplication services	95.29
130	Retail sale of electrical wiring and fittings and other electrical equipment	No code
131	Retail sale of plumbing and heating equipment	No code
132	Retail sale of hardware and paints in specialised stores	47.52
133	Retail sale of flat glass	47.52
134	Retail sale of building materials	47.52
135	Second-hand store: Retail sale of second-hand clothes, books and other second-hand goods	47.78
136	Farmer's market: Retail sale via stalls and markets	47.8
137	Jewellery store: Retail sale of watches and jewellery in specialised stores	47.77
138	Retail sale of medical and orthopaedic goods in specialised stores	47.74
139	Retail sale of travel and camping equipment and accessories	47.72, 47.64
140	Retail sale of scale models, arts and crafts equipment and materials	No code
141	Sex shop: Retail trade of sex products	No code
142	Photographer's shop: Retail sale of photographic, optical and precision equipment	47.78
143	Retail sale and repair of bicycles	47.74, 95.29
144	Retail sale of sanitary fixtures, tiles and other ceramic products	47.52
145	Retail sale of carpets, rugs, wall and floor coverings in specialised stores	47.53
146	Retail sale of electrical household appliances in specialised stores	47.43, 47.54
147	Sale of motor vehicles	45.1
148	Retail sale of motor vehicle parts and accessories	45.32
149	Sale of motorcycles and related parts and accessories	45.4
150	Retail sale of second-hand motor vehicles and motorcycles	47.79
151	Retail sale and repair of musical instruments	47.59, 33.19, 95.29
152	Retail sale of marine and fishing gear	47.72, 47.64
153	Retail sale of weapons and ammunition	47.78
154	Retail sale of textiles in specialised stores	47.51
155	Pet shop: Retail sale of pet animals and pet food in specialised stores	47.76
156	Retail sale of souvenirs, handicrafts and religious articles	47.78
157	Art gallery: Retail sale of art and activities of commercial art galleries	47.78
158	Antique shop: Retail sale of antiques	47.79
159	Auction house: Retail trade performed in auction houses	47.79
160	Other retail sale of new goods in specialised stores	47.78
161	Retail sale through mail order houses or the Internet	47.91
162	Services related to the provision of electricity and natural gas through mains	35.14, 35.23
163	Hairdressers	96.02
164	Beauty salons and massage parlours	96.04
165	Tattooing and piercing studios	96.09
166	Brothels and escort services	No code
167	Services of astrologers and spiritualists	96.09
168	Veterinary and pet care services	96.09
169	Photographic services	74.2
170	Photocopying, document preparation and other specialised office support services	82.19
171	Washing and drycleaning services	96.01
172	Car washing and polishing services	45.20
173	Performance testing of motors and automobiles	71.20
174	Laboratories for technical testing and analysis	71.20
175	Renting and leasing of motor vehicles, air and water transport equipment	50.10, 50.30, 77.1, 77.34, 77.35
176	Renting and leasing of personal and household goods	77.2
177	Renting and leasing of machinery, equipment and tangible goods	77.31–77.33, 77.35, 77.39
178	Shoemaker's workshop: Repair of footwear and leather goods	95.23
179	Tailor/seamstress: Repair and alteration of clothing	95.29
180	Repair of computers and peripheral equipment	95.11
181	Repair of communications equipment	95.12
182	Repair of consumer electronics and household appliances	95.21, 95.22
183	Repair of watches, clocks and jewellery	95.25
184	Mechanical maintenance and repair of motor vehicles	45.2
185	Electrical maintenance and repair of motor vehicles	45.2
186	Bodywork maintenance and repair of motor vehicles	45.2
187	Repair and replacement of seats of motor vehicles	45.2
188	Repair and replacement of screens and windows of motor vehicles	45.2
189	Sales, repair, fitting and replacement of exhaust pipes of motor vehicles	45.2
190	Sales, repair, fitting and replacement of tyres and tubes of motor vehicles	45.2
191	Maintenance and repair of motorcycles	45.4
192	Repair of machinery and metal products	33.11, 33.12
193	Repair of electrical equipment	33.14
194	Repair of electronic and optical equipment	33.13
195	Repair of other equipment	33.19, 95.24

(Continued)

Table 4 Continued.

	Unitary types of urban uses	NACE Rev.2 codes
196	Hotels, motels and hostels providing short-term accommodations	55.1, 55.2
197	Hotels providing accommodations and recreation	55.1, 55.2
198	Camping grounds, recreational vehicle parks and trailer parks	55.3
199	Mountain refuges	55.2
200	Beaches	93.29
201	Cocktail lounges, beer parlours, cafeterias, coffee shops and juice bars: Preparation and serving of beverages for immediate consumption on the premises	56.3
202	Restaurants, taverns, pizza parlours, snack bars: Provision of food services to seated customers	56.1
203	Patisseries, pastry shops and donut shops: Provision of confectioneries to seated customers	No code
204	Canteens, street stalls and take-out restaurants: Provision of food and beverages to non-seated customers	56.1
205	Dance halls, bars, clubs, clubs with live music and discotheques: Night entertainment with the provision of food and beverages to seated customers	56.3
206	Fun parks for children	No code
207	Coin-operated games	93.29
208	Bowling lanes	93.11
209	Cinemas: Motion picture projection activities	59.14
210	Gambling and betting shops	92
211	Casinos	92
212	Turkish baths, saunas and steam baths	96.04
213	Amusement parks	93.29
214	Public administration	84.1
215	Social security offices	84.3
216	Local administration offices	No code
217	Embassies and consulates	84.21, 99.00
218	Head offices of companies	70.1
219	Offices of international organisations	99
220	Chambers of Commerce, employers' organisations, professional associations and trade unions	94.11–94.13
221	Offices of political organisations	94.92
222	Offices of sport clubs	93.12
223	Offices of non-government organisations, associations and movements	94.99
224	Banks and credit unions	64.1
225	Currency exchanges	
226	Offices of financial leasing	64.91
227	Pawnbrokers	64.92
228	Stock exchanges	66.11
229	Stockbrokerages	66.12
230	Activities of holding companies	64.2
231	Trust funds and similar financial entities	64.3, 66.19, 66.3
232	Other financial services	64.99
233	Private insurance, reinsurance and pension fund offices	65, 66.2
234	Management consultancy offices	70.2
235	Accounting, bookkeeping and auditing offices	69.2
236	Legal offices	69.1
237	Architectural and engineering offices	71.1
238	Graphic, industrial and fashion design and interior decoration studios	74.1
239	Advertising offices	73.1
240	Real estate and real estate appraisal offices and other offices of commission agents	68, 46.1
241	Publishing of books, periodicals and other publishing activities	58
242	Wire-based, wireless, satellite and internet-based telecommunications services	61, 63.99
243	Radio stations	60.1
244	Television programming and broadcasting companies	60.2
245	Offices of web portals	63.12
246	News agencies	63.91
247	Motion picture, video and television programme production and post-production services	59.11, 59.12
248	Motion picture, video and television programme distribution services	59.13
249	Sound recording and music publishing services	59.20
250	Psychological, marriage and family counselling and credit and debt counselling services	88.99
251	Computer programming, consultancy, data processing, hosting and related activities	62.01, 62.02, 62.09, 63.11
252	Translation and interpretation activities	74.3
253	Employment and human resources services	78
254	Dating services	96.09
255	Market research and public opinion polling	73.2

(Continued)

Table 4 Continued.

	Unitary types of urban uses	NACE Rev.2 codes
256	Private investigators	80.3
257	Office and secretarial support services	82.19
258	Call centres	82.20
259	Billing and record-keeping services for complexes and multistorey buildings	82.11
260	Organisation of conventions and trade shows services	82.3
261	Travel agencies, tour operators and other related offices	79
262	Funeral and related services	96.03
263	Collection agencies and credit bureaus	82.91
264	Other personal services	74.9, 90.02–90.04, 93.19
265	Catering and other food service activities	56.2
266	Security services	80.1, 80.2
267	Maintenance, cleaning and disinfecting services for buildings and gardens	81
268	Operation of sewage systems, waste collection, remediation activities and other waste management services	37, 38.1, 39
269	Freight transport services	49.41, 50.20, 50.40, 59.29
270	Removal services	49.42
271	Construction activities	41, 42, 43
272	Nursery schools	85.1
273	Elementary schools	85.2
274	Lower secondary schools and special lower secondary schools	85.31
275	Upper secondary schools and technical, vocational and other special upper secondary schools	85.32, 85.33
276	Post-secondary non-tertiary technical and vocational institutes and colleges	85.41
277	Technological educational institutes	85.42
278	Universities	85.42
279	Learning centres, foreign language centres, computer skills and other private educational institutions	85.59, 85.6
280	Music, dance, drama, photography and other fine arts schools	85.52
281	Driving, flying, sailing and shipping schools	85.32, 85.53
282	Research centres, research laboratories and research institutes	72
283	Concert halls, theatres and other arts facilities	90.01
284	Libraries and archives	91.01
285	Museums and galleries	91.02
286	Conference centres	No code
287	Exhibition halls, showrooms and trade shows	No code
288	Archeological sites, historical sites and buildings and similar visitor attractions	91.03
289	Churches, mosques, temples, synagogues and other places of worship	94.91
290	Burial activities	94.91
291	Cemeteries and memorial parks	No code
292	General and specialised hospitals and clinics	86.1
293	Blood banks, sperm banks and transplant organ banks	86.90
294	Medical, paramedical and dental practices	86.2, 86.9
295	Blood analysis, X-rays and other diagnostic laboratories	86.90
296	Orphanages and children's boarding homes and hostels	87.90
297	Homes for the elderly	87.1
298	Facilities for the mentally retarded and psychiatric convalescent homes	87.20
299	Facilities for alcoholism or drug addiction treatment	87.20
300	Temporary homeless shelters and other homes for persons with social or personal problems	87.90
301	Refugee camps	No code
302	Nurseries and child day-care homes	88.91
303	Other social services without accommodations	88.99
304	Military bases and other defense installations	84.22
305	Police stations, port and marine police, border and coastguard police stations	84.24
306	Fire brigade	84.25
307	Justice and judicial installations	84.23
308	Prisons	No code
309	Football stadiums, with or without track	93.11
310	Track and field stadiums	93.11
311	Basketball and volleyball stadiums	93.11
312	Artistic gymnastics, wrestling, boxing and weightlifting halls	93.11
313	Tennis courts	93.11
314	Swimming pools and stadiums	93.11
315	Shooting ranges	93.11
316	Ice rinks	93.11
317	Velodromes	93.11
318	Racetracks for horse races	93.11
319	Racetracks for cars and motorcycles	93.11
320	Golf courses	93.11

(Continued)

Table 4 Continued.

	Unitary types of urban uses	NACE Rev.2 codes
321	Winter sports arenas and stadiums	93.11
322	Fitness facilities and schools of martial arts and alternative gymnastics	85.51, 93.13
323	Housing	No code
324	School dormitories and student residences	55.9
325	Serviced apartments and condominium hotels	55.1, 55.2
326	Urban greenery	No code
327	Playgrounds	No code
328	Urban squares	No code
329	Neighbourhood parks and open green spaces	No code
330	Botanical and zoological gardens and theme parks	91.04, 93.21

As we noted above, NACE Rev. 2 has a single code for all sports activities, whether they take place in open or closed installations, with or without spectators. However, although from the economic point of view sports installations refer to a single set of activities, from the urban planning point of view this group of uses is so heterogeneous that it cannot be defined as a single unitary type. The criterion we used for the organisation of sports into unitary types is the *architectural type* of the shell of the sports installations. This choice is related to the fact that sports installations are frequently used for more than one sports activity, which makes it difficult to define the unitary type using as criterion only the nature of the sports activity which it serves. For example, a closed gymnasium can be used for both basketball and volleyball games, as a swimming pool can be used for either swimming competitions, water polo games or synchronised swimming. As a result of such observations, we decided to define the unitary types of uses according to the types of sports installations, each of which covers a limited number of sports activities, namely those which can be accommodated by the particular architectural shape of its shell.

On the basis of the above criterion, NACE Rev. 2 code 93.11 is subdivided into the following unitary types of uses: football stadiums, with or without track (309), track and field stadiums (310), basketball and volleyball stadiums (311), artistic gymnastics, wrestling, boxing and weightlifting halls (312), tennis courts (313), swimming pools and stadiums (314), shooting ranges (315), ice rinks (316), velodromes (317), racetracks for horse races (318), racetracks for cars and motorcycles (319), golf courses (320) and winter sports arenas and stadiums (321). On the basis of the nature of the activity, one additional unitary type of use was created: fitness facilities and schools of martial arts and alternative gymnastics (322), which concludes the organisation of sports activities into unitary types.

Finally, for the classification of green spaces, we used the distinctions adopted in the Official Government Gazette, Ministerial Decree 285/D/5.3.2004. Here, the unitary types of green spaces are defined as: (a) urban greenery (326), that is, small green spaces which contribute to rational design and the creation of openings in constructed urban space; (b) playgrounds (327), which include greenery and play spaces for small children; (c) urban squares (328), which are used as spaces of social gathering and leisure where greenery is not the principal characteristic; (d) neighbourhood parks and open green spaces (329), where greenery is the principal characteristic but which may also include active sports activities, such as small sports installations, playgrounds and other play

areas and (e) botanical and zoological gardens and other theme parks (330).

The contribution of the catalogue of the unitary types of urban uses

Uses, like any other social product, are constantly under the influence of the social whole which led to their creation. Some uses fall into disuse and gradually disappear, together with the social need which created them; others are transformed or adapted, while new uses appear in urban space to accommodate contemporary needs. From this point of view, the catalogue of the unitary types of urban uses in the present paper may satisfy the needs of urban analysis for a relatively limited time, before it needs to be revised. Such periodic revisions also allow for the diachronic study of the historical development of uses, that is, their first appearance, transformation or disappearance, processes immediately linked to the socio-economic, technological and cultural developments in a society.

However, the formulation of a catalogue of urban uses is not an unstable enterprise, for the following reasons:

(a) NACE Rev. 2 is a classification system internationally used by economists, a fact showing that the economists give it credibility, and thus there is no reason why planners should not have a corresponding operational tool.

(b) NACE Rev. 2 (615 numerical codes) is the revision of NACE Rev. 1.1 (514 such codes), made in 2002 and legally established in 2006. Although certain criteria for structuring the classification have been reviewed, and new concepts at the highest level, but also new details, were introduced, the general characteristics of NACE remained stable, as did the structure of the areas of the classification that did not require noticeable change. The conclusion is that adaptations took place on a standard basic structure showing a significant inertia in time.

(c) The first four digits of the numerical code are standardised for all European countries, but there is provision for national peculiarities on lower levels of the classification. It is at this level that we have added numerical codes based on peculiarities in Greece, and of course, such peculiarities also occur in other countries.

(d) An analysis of urban space starts in the preliminary stage with the unitary types of urban uses, but, due to the scale of urban plans as well as to other practical constraints, the planner cannot operate at this level of

detail. This is why urban maps display larger functional groups than the unitary types. It is probable that these categories show greater stability over time.

(e) As we saw, urban uses are social products and thus change as a function of social dynamics, but the present dominant socio-economic system, advanced capitalism, has for many years had an unambiguous orientation, which makes it very likely that the development of uses will continue to follow a comparable structuring for some time in the future.

We conclude from the above that any future revision of our catalogue of unitary types will of necessity be small, subject to the addition and subtraction of a limited number of unitary types. As a result, the main body of the present catalogue seems to show a significant inertia over time and can thus form a stable basis for the analysis of urban space by planners, urban geographers and surveyors.

The creation of a description of urban space on the basis of specific unitary types has an immediate practical advantage for urban analysis, since it permits the comparison of different descriptions. On the other hand, a description of urban space making direct use of larger functional groups (e.g. retail trade, services and leisure) creates classifications which are non-comparable. The impossibility of comparison results both from the different sets of unitary types included under the label of each of the larger functional groups, and from the use of different functional groups in different classifications.

The usefulness of a catalogue of urban uses is not limited to analytical purposes. As is well known, the proposal for an urban plan implies a set of procedures, among which the survey of the existing land-use organisation in the area under study and the proposed location of land uses. During both the analytical survey phase and the normative proposal phase, the basic concept of reference are the urban and land uses, that is, the main axis of urban planning are uses, whence the need to have recourse to a reliable catalogue of uses. We referred earlier to the issue of the indicators of urban uses. In many countries these are given a legal form, but even in countries such as Denmark, where this is not the case, the planner cannot avoid taking them into account, albeit in an *ad hoc* form. Both the legal and the *ad hoc* prescriptions for urban-use indicators and the legal prescriptions for urban zones are still based on a catalogue of uses or more generally on their classification, which represents a next step of operation on uses. Thus, we understand how theory can be used as concrete guidance for practitioners and legislation.⁵

Although the description of urban space on the basis of the unitary types is useful in practice, the level of detail it creates makes it necessary, as we already observed, to classify the unitary types, into larger functional groups in order to reveal and study the wider functional structure of urban space. This necessity becomes apparent during the mapping of uses, which by its nature imposes visual (cartographical) limitations. Since any classification can be constructed either top-down (on the basis of successive logical divisions of the population of objects to be classified) or bottom-up (on the basis of successive groupings of the objects), the present catalogue of unitary types

provides a starting point for the bottom-up grouping of uses, with the goal of creating a complete classification. The issue of the classification of urban uses, as that of the catalogue of unitary types, remains inadequately studied in the current bibliography, forming an additional object of study for the creation of a theory of uses. We hope that the present paper constitutes a contribution to this field.

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⁵We fully agree with one of our reviewers, who observes that the legal restrictions on land-use and the attitude of administrative courts frequently leads to less flexible and innovative planning.

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