

## The C.A. Doxiadis Reader

### Table of contents

1. Introduction .....	27
2. Towards the science of human settlements .....	31
3. Problems of human settlements .....	77
4. Methodology of action .....	109
5. Emergence and growth of large urban systems .....	165
→ 6. Glossary of selected terms.....	207

## 6. Glossary of selected terms



Awarding of the Tulane University honorary Doctorate of Law degree to C.A. Doxiadis, New Orleans, USA, 27 May, 1968. (Source: © Constantinos A. Doxiadis Archives of the Constantinos and Emma Doxiadis Foundation).

# Glossary of selected terms

**Accessibility model:** A mathematical model for the distribution of population among sections of a study area based on the concept of accessibility. It is also referred to in the text as population distribution model.

**Agglomeration economies:** Economies which occur when a firm can profit by locating in close proximity to other firms, or when it is profitable for one firm to grow very large by combining many different but associated processes in a single organization.

**Alternative:** Refers to the alternative conceptual development patterns for the study area by the target year. It can be thought of as a point in the many-dimensional parameter space of the urban system.

**Anthropics:** total discipline covering the whole knowledge about Man, or the Science of Man as suggested by Alexis Carrel in *Man, the Unknown*. We need Anthropics, the science based on the wholeness of Man, *anthropos*, to help us study and develop him, since we cannot achieve this by simple coordination of his separate aspects. Term coined by the author, first used in the Delos Symposium of July 1966 and his speech delivered at the Aspen Institute for Humanistic Studies on July 29, 1966.

**Anthropocosmos:** world of Man as distinguished from the great world or cosmos beyond Man's reach. Term coined by the author, from the Greek words *anthropos* and *cosmos*, 'man' and 'world'; first used in his lecture at the Swarthmore College Centennial Year Celebrations in 1964, entitled *The Human Crust of the Earth*.

**Basic employment:** That part of total employment producing primarily for export outside a given area. It assumes a strict definition of the area of reference. Basic employment is used in this study as an attraction variable in the accessibility model for the spatial distribution of future population in the study area.

**Ceiling density:** An assigned maximum population density introduced in the accessibility model as an upper limit not to be exceeded in a given study unit.

**Census tracts:** As used by the U.S. Bureau of the Census to denote small areas into which large cities and adjacent areas have been divided for statistical purposes. Tract boundaries have been generally designed to be relatively uniform with respect to population characteristics, economic status, and living conditions. The average tract has about 4,000 residents.

**Center system:** A low-speed transportation system providing high capacity and designed to serve high-density multi-purpose centers internally, such as major business districts, airports, universities, shopping centers.

**Central Business District (CBD) of Detroit:** As defined by the Detroit City Plan Commission, an area roughly bounded by the John Lodge Freeway on the west, the Chrysler Freeway on the east, the Fisher Freeway on the north, and the Detroit River on the south. It includes an area of 1.25 square miles.

**Central Functions Area (CFA) of Detroit:** Name given in this study to an area forming an elongated nucleus of central functions in the City of Detroit. It is bounded by the John Lodge Freeway on the west, the Chrysler Freeway on the east, the Detroit River on the south, and by Clairmount and Owen avenues north of Grand

Boulevard. It includes the present CBD of Detroit, the New Center around the Fisher Building, the Wayne State University campus and the emerging new Medical Center. It covers approximately 5 square miles. It could be considered the future CBD of Detroit.

**Central Region:** Name given in this study to the Detroit SMSA which includes the Michigan counties of Wayne, Oakland and Macomb. It is the most important urban subregion of UDA and covers an area of about 2,000 square miles.

**City of Detroit:** The geographical area covered by the municipality of the City of Detroit alone.

**Cluster (and Similarity) Analysis:** A technique belonging to the broader class of taxonomic or classificatory methods which may be used to partition a set of  $n$  study units each characterized by  $q$  attributes into a number of clusters or groups which are internally as homogeneous as possible.

**Community class:** Based on a systematic classification of human communities expressed in the Ekistic Logarithmic Scale (ELS), starting from the smallest human community corresponding to only a group of dwellings (community class I) up to the largest possible community corresponding to the universal city or Ecumenopolis (community class XII).

**Community or local system:** A low-speed transportation system serving travel within communities or groups of communities constituting major and somewhat self-contained parts of a metropolitan area.

**Concept-Plan:** An illustrative conceptual arrangement of future physical development in the various parts of UDA, based on the detailed elaboration of the selected alternative.

**Continuously Increasing Dimensionality Method (C.I.D.):** the process of the gradual increase of scale in the application of the I.D.E.A. method, in order to permit the introduction of more dimensions in the search for the best alternative.

**Cosmopolis:** the city of Cosmos (space).

**Critical Area of Detroit:** Name given in this study to a compact area of decline in the City of Detroit. This decline refers to population, income, and physical conditions in general. Income losses were found to correspond much better with the problem area in terms of most phenomena studied, and the Critical Area of Detroit was defined by 1960 Census Tracts that lost per capita income during 1950-1960. It occupies the middle third of the City of Detroit, that is an area of 50.7 square miles.

**CRP:** Community Renewal Program.

**Daily Urban Systems:** Daily Urban Systems correspond to major urban clusters such as UDA, within which people will be able to commute daily in the future with new and faster transportation systems as they do at present in well organized metropolitan areas.

**Deepways:** the whole system of underground lines of transportation for private or mass-transportation vehicles, few or many, travelling at all speeds, which is indispensable for the solution of our urban problems. Term coined by the author, first used in his studies of 1965 and 1966 and in his book *Between Dystopia and Utopia*, 1966.

**Detroit Central City:** The geographical area encompassed by

- the cities of Detroit, Highland Park and Hamtramck.
- Directional forces:** Forces of attraction or repulsion that exist in or around human settlements and influence their structure, form and pattern of development.
- Dual-mode vehicle:** A vehicle which travels under automatic control on special guideways and under manual control on city streets.
- Dynamegalopolis:** a growing Megalopolis.
- Dynametropolis:** a metropolis which exhibits continuous growth like the Dynapolis. A Dynametropolis contains, all the phenomena that characterise a Dynapolis, only intensified in scale and complexity. In some respects Dynametropolis may, in addition to its major urban areas, contain examples of all types of settlements including agricultural and nomadic. Term coined by the author.
- Dynapolis:** dynamically growing 'polis' or dynamic city. The ideal Dynapolis depends on the type of city we are dealing with. Term coined by the author, and used since the early fifties in teaching and writing; used in his book *Architecture in Transition*, 1963.
- Ecumenopolis:** The coining city that will, together with the corresponding open land which is indispensable for man, cover the entire earth as a continuous network of urbanized areas forming a universal settlement.
- Ekistic elements:** The five elements which compose the human settlements: Nature, Man, Society, Shells and Networks.
- Ekistic Logarithmic Scale (ELS):** A classification of settlements according to their size, presented on the basis of a logarithmic scale, running from man (unit 1) as the smallest unit of measurement to the whole Earth (unit 15). The Ekistic Logarithmic Scale can be presented graphically, showing area or number of people corresponding to each unit, etc., so that it can be used as a basis for the measurement and classification of many dimensions in human settlements.
- Ekistics:** The science of human settlements. It conceives the human settlement as a living organism having its own laws and, through the study of the evolution of human settlements from their most primitive phase to megalopolis and Ecumenopolis, develops the interdisciplinary approach necessary to solve its problems.
- Ekistic unit:** A classification of parts or whole human settlements, starting from unit 1 corresponding to man and ending with unit 15 corresponding to Ecumenopolis. From unit 4 which corresponds to community class I to unit 15 which corresponds to community class XII, the ekistic units coincide with the classification of human communities expressed in the Ekistic Logarithmic Scale (ELS).
- Entopia:** place that is practicable—that can exist. Term coined by the author, from the Greek words *en* and *topos*, 'in' and 'place'. First used in the Trinity College Lectures, Hartford, Conn., 1966, and published in his book *Between Dystopia and Utopia*, 1966. **Force-mobile:** the interplay created by all forces which act and evolve in the human settlements. A heuristic model based on the forces of attraction of functions of several classes depending on the type of problem which is faced. It is used for the evaluation and comparison of alternatives.
- Eopolis:** village.
- Expressway:** A high-speed urban road facility with partial control of access, serving conventional vehicles.
- Floor Area Ratio (FAR):** The ratio of total floor area of a building to its site area.
- Force-mobile:** The interplay created by all forces which act and evolve in the study area. A heuristic model, based on the force-mobile created by the interaction of major functions, was developed and used for the evaluation of alternate locations of these functions.
- Freeway:** A high-speed urban or rural road facility with full control of access, serving conventional vehicles and providing an uninterrupted flow.
- Friction factors:** Coefficients entering the accessibility model for population distribution and the gravity model for trip distribution, and expressing the traveling habits of the inhabitants of the urban system as a function of travel time.
- Functions:** all types of activities within a human settlement, such as movement of people or industrial activities, research and education activities, and so forth, as distinct from *structure* such as roads and highways or an industrial zone, university campus, and so forth.
- Gravity model:** A transportation model for the distribution of movements among the zones of the study area. The name "gravity model" is derived because of its analogy to Newton's law of gravitational interaction.
- Great Lakes megalopolis (GLM):** The megalopolitan formation which is emerging around the Great Lakes of North America involving parts of the states of Wisconsin, Illinois, Indiana, Michigan, Ohio, Pennsylvania and New York and a strip of the provinces of Ontario and Quebec contiguous with the Great Lakes and the St. Lawrence Seaway. This main part of GLM had in 1960 a population of 36 million, within an area of about 89.2 thousand square miles. It is encompassed by a secondary and an outer zone, with about 36 million inhabitants within an area of 457.6 thousand square miles, extending into the states of Minnesota, Iowa, Missouri, Kentucky, West Virginia and Vermont, in addition to covering more area of the states and provinces mentioned above.
- Group centroids:** A term denoting the mean values of a group of study units, for each of the variables (attributes) that have been used to classify study units into internally homogeneous groups during a cluster analysis process for the definition of the Great Lakes megalopolis.
- High-speed ground transport:** A future mass land transportation system based on new technological developments, expected to serve mainly regional and national travel at running speeds beyond 150 mph.
- Human Community:** is designed on a human scale in all its elements, with emphasis placed on the requirements of the pedestrian in design, movement, spatial dimensions, etc.; the non-human machine scale being restricted to the borders of the community.
- Human scale:** Derived from man and defined by his physical dimensions, senses and movements.
- Ideal city:** mentioned by several authors especially in relation to the physical aspects of the city and the disciplines of architecture and physical planning in distinction to Utopia which seldom refers to these aspects.
- Isolation of Dimensions and Elimination of Alternatives method (IDEA):** The gradual isolation of dimensions and the selection, by elimination, of the alternatives, conceived along the isolated dimensions, that satisfy certain ekistic criteria. It is an attempt to eliminate the arbitrariness in the search of the many-dimensional parameter space of the urban system for the optimum alternative.
- Kinetic field:** The distance man can move within a certain period by walking, by using animals or by using vehicles.
- LPA:** Local Public Agency.
- Man:** One of the five ekistic elements; the individual with his own characteristics and problems as distinct from society.
- Megalopolis:** A greater urbanized area resulting from the merging of metropolises and cities into one urban system. Its population is calculated in tens of millions. It is

distinct from the metropolis, either because its population exceeds ten million, in which case it also covers a vast surface area, or because it has incorporated more than one metropolis. Term used since ancient Greece when the small city of Megalopolis was created in Arcadia. Jean Gottman gave a special meaning to this ancient term in 1961 in his book *Megalopolis, the Urbanized Northeastern Seaboard of the United States*, a 20th Century Fund Study, The M.I.T. Press, Massachusetts Institute of Technology, Cambridge, Mass., 1961.

**Metropolis:** A major, multi-center urban area with more than 50,000 people incorporating other small settlements both urban and rural, growing dynamically to sizes as high as 10 million people. The average population of such settlements between 50,000 and 10 million inhabitants is of the order of 2.5 million, while about one half of these settlements have a population varying between 50,000 and 100,000.

**Metropolitan guideway:** A guideway for dual-mode vehicles when operating under automatic control. Metropolitan guideways are parts of the Metropolitan System serving medium and low intracity trips.

**Metropolitan systems:** A high-speed transportation system serving medium and long intracity trips, within and across the relatively compactly developed portions of a metropolitan area.

**Modal split:** The distribution of person trips among the conventional means, the future new transportation means or a combination of the two.

**NAHRO:** National Association of Housing and Redevelopment Officials.

**National system:** A high-speed ground transportation system serving long intercity travel along a few selected corridors of national importance.

**Nature:** The natural environment of man as it exists before he starts remodeling it by cultivation and construction. It provides the foundation upon which the settlement is created and the frame within which it can function.

**Necropolis:** a dead city.

**Net residential density:** It refers to dwelling units per acre corresponding to a strictly residential neighborhood which includes only residential sites as well as internal streets and playgrounds.

**Networks:** term with many meanings depending on the discipline concerned. Used in the present book to indicate the man-made systems which facilitate the functioning of the settlement, such as, roads, water supply networks, electricity, etc. **Shells:** term with many meanings depending on the discipline concerned. Used in the present book to indicate all types of structures which Man uses to live in or to put animals, machinery, produce, etc., in; the structures within which Man lives and carries out his different functions; the structures that cover Ekistic functions.

**North American setting:** The continental United States and the southern parts of Canada.

**Polis:** city.

**Principal Component Analysis:** A statistical method aiming at reducing a complex set of  $p$  interrelated variables, observed on a set of  $n$  study units, to a limited number of underlying basic dimensions.

**Regional system:** A high-speed ground transportation system serving long trips of regional character or long trips within large metropolitan areas.

**Secondary employment:** That part of total employment which serves primarily local needs of a given area. It is the complement of basic employment, and is also referred to as non-basic employment.

**Shells:** All types of structures within which man lives and carries out his various functions.

**Similarity tree:** A graph, often referred to as a dendrogram with a tree-like structure, showing the level at which two study units join together (fuse) to form a new group during a similarity analysis process.

**Society:** term with many meanings depending on the discipline concerned and also on different schools of thought. Used in the present book to indicate human society with all its characteristics, needs and problems; individuals are examined only as parts of it.

**Standard Metropolitan Statistical Area (SMSA):** As used by the Bureau of the Census to mean a county or a group of counties containing at least one city with 50,000 inhabitants or more and having economic and social relationships with contiguous counties of a metropolitan character. For a more detailed definition see the introduction to any of the *1960 Census of Population* reports, U.S. Bureau of the Census.

**Study units or zones:** Convenient subdivisions of UDA into units of study for the examination and comparison of the various phenomena and the application of mathematical models. The study units used mainly correspond to townships except for the Detroit Central City and the new major twin urban center where smaller units were defined by the future transportation grid of these areas (Fig. 414).

**Texture forces:** Forces that exist in human settlements, which spread around humans, animals, machines, Shells or Networks, or in an abstract way around points, lines, areas or volumes and cannot be expressed as directional forces. They influence the structure and form of settlements but mainly their density and size.

**Urban Detroit Area (UDA):** The study area of immediate urban influence of Detroit. It can be considered to represent the Daily Urban System of Detroit. It extends over an area with a radius of about 85 miles from the city and includes 25 counties in Michigan, 9 in Ohio and 3 in Canada. The area covered is 23,059 square miles.

**Urbanized area:** As used by the Bureau of the Census to mean a conurbation containing one or more central cities, with 50,000 inhabitants or more, as well as the remainder area of the urban fringe which consists either of incorporated places of at least 2,500 inhabitants or 100 housing units of unincorporated areas with a density of 1,000 inhabitants and over per square mile. For a more detailed definition see the introduction to any of the *1960 Census of Population* reports, U.S. Bureau of the Census.

**Utopia:** an imaginary and indefinitely remote place, a place or state of ideal perfection, especially in laws, government, and social conditions. First used by Sir Thomas More for an imaginary and ideal country in his book *Utopia*, 1516; it is a Greek word, a combination of *ou*, 'not', and *topos*, 'place', meaning no-where or no-place.