

General
Theory of
Urbanization
1867

Ildefons
Cerdà

THE GENERAL THEORY OF URBANIZATION

INTRODUCTION	2
Mercè Conesa, President of the Diputació de Barcelona	
CERDÀ: UNIVERSAL AND CONTEMPORARY	4
Damià Calvet, Director of the Institut Català del Sòl (Catalan Land Institute)	
URBANIZATION: THE SCIENCE OF MAKING CITIES	11
Vicente Guallart, Architect	
GENERAL THEORY OF URBANIZATION	35
To the Reader	49
Preface	53
PART I	
ON URBANIZATION IN GENERAL – Introduction	65
BOOK I	
THE ORIGINS OF URBANIZATION – Preliminary Remarks	71
CHAPTER I	
THE NEED FOR SHELTER IS THE ORIGIN OF URBANIZATION	72
CHAPTER II	
MAN'S SOCIABILITY IS THE REASON FOR THE DEVELOPMENT OF URBANIZATION	79
BOOK II	
THE DEVELOPMENT OF URBANIZATION – Preliminary Remarks	83
CHAPTER I	
ELEMENTAL AND PRIMITIVE URBANIZATION – Preliminary Remarks	85

§ – I	
HISTORICAL OUTLINE OF THE DEVELOPMENT PROCESS OF BASIC AND PRIMITIVE URBANIZATION	88

§ – II	
ANALYTICAL AND EPILOGICAL SUMMARY OF THE PRECEDING PARAGRAPH	107
A Troglodytism	108
B Natural Troglodytism	108
2B Artificial Troglodytism	108
2A Cyclopeanism	109
B Semi-underground constructions	109
2B Aboveground constructions	110
3A Tegurism	111
B The hunter's hut	112
2B The shepherd's cottage	113
3B The farmer's farmhouse	114

CHAPTER II	
SIMPLE COMBINED URBANIZATION – Preliminary Remarks	117

§ – I	
ON SIMPLE, HOMOGENEOUS URBAN COMBINATIONS	119
A On simple and homogeneous urban combinations adapted to the customs and necessities of a tribe of shepherds	119
2A On simple, homogeneous urban combinations adapted to the customs and needs of a farming tribe	121
3A On simple, homogeneous urban combinations adapted to the customs and necessities of a tribe of craftsmen and merchants	125
4A On simple, homogeneous urban combinations adapted to the customs and necessities adapted to the customs and necessities of a hunter or warrior tribe	129
Epilogical Summary of this Section	133

§ – II	
HISTORICAL OUTLINE OF SIMPLE BUT HOMOGENEOUS URBAN COMBINATIONS	135
A Installation of the colony and the idea of its settlement	136
2A The natural and spontaneous connection of dwellings	138
3A Combining efforts for the common defense	141
4A Development of the constructions	142
5A Emigration and transcendental life of the colony	144

§ – III	
DISTINCTIVE TRAITS OF COMPOUND URBANIZATION AND ITS ADVANTAGES	146
A Harmony between family independence and sociability in ruralized urbanization	148
2A Neutralization of the effects of fortification as a result of ruralized urbanization	149
3A Absolute freedom in construction without detriment to third parties in ruralized urbanization	150
4A Urban prosperity of our colony as a result of ruralized urbanization	151

CHAPTER III	
ON THE DIFFERENT URBAN COMBINATIONS, PRACTICED ACCORDING TO THE CHARACTER, CUSTOMS AND NEEDS OF CERTAIN PEOPLES – Preliminary Remarks	155
§ – I	
A RETROSPECTIVE LOOK AT SIMPLE COMBINED URBANIZATION, CONSIDERED IN ITS TRANSITION TOWARD COMPLEX URBANIZATION	157
§ – II	
GREEK URBANIZATION	168
§ – III	
PHOENICIAN URBANIZATION	178
§ – IV	
ROMAN URBANIZATION	181
A Roman urbanization, considered in its Etruscan origin	181
2A Ruralized character of the original Roman urbanization	187
3A Causes and effects of the later densification	189
4A Roman urbanization in the Roman provinces	192
§ – V	
FEUDAL URBANIZATION	196
A Period of transition	196
2A Feudal urbanization in full operation	198
§ – VI	
SPANISH-ARABIAN URBANIZATION	200
§ – VII	
HISPANIC-AMERICAN URBANIZATION	204
Epilogical Summary of this Chapter	208
BOOK III	
AN ANALYTICAL EXAMINATION OF THE CURRENT STATE OF URBANIZATION	
– Preliminary Remarks	215
CHAPTER I	
DIFFERENT TYPES OF URBS AND THE TYPE WE WILL FOCUS ON HERE	217
– Preliminary Remarks	
§ – I	
AQUATIC URBS	219
A Aquatic urbs where dwellings and streets are on water	219
2A Urbs where only dwellings are on water, and the roads are on dry land	221
3A Urbs that are aquatic in terms of their roads, but where dwellings are on dry land	221

§ - II	
TERRESTRIAL URBS	223
A Underground or troglodyte urbs	223
2A Urbs with dwellings raised above ground level	225
3A Urbs that are truly terrestrial in terms of both roads and dwellings	225

CHAPTER II	
MAIN AND ACCESSORY PARTS INTO WHICH THE LAND ON WHICH AN URBS IS LOCATED CAN BE DIVIDED	227

§ - I	
ON THE REGION	229
A On the region in relation to the settlement of an urbs	230
B On regions located on the crest of a hill	231
C On regions located on the pronounced, well-defined crest of a hill	231
2C On regions located on a plateau	233
2B On regions located on a hillside	234
3B On regions located in lowlands	235
C On regions located in lowlands with a stream	235
2C On regions located in lowlands with a navigable river	236
3C On urban regions near the sea	238
2A On the region viewed as the sphere of influence of the urbs	241

§ - II	
ON THE SUBURBS	245
A History of the formation of the suburbs	245
B Suburbs built because of the attraction of roads	246
2B Urban industrial suburbs or appendages, which can be found in all large urbs, and even in a few that could not be described as large but which are relatively important, are different	247
3B Suburbs shaped by administrative reasons	247
4B On suburbs built as a means of urban expansion	248
2A On the suburbs considered independently and in their relations with each other and with the urbs around which they are built	249
B On the suburbs considered independently	250
2B On the suburbs in their relations with one another and with the urbs around which they are built	251

§ - III	
ON THE URBAN NUCLEUS	254
A On the shape and size of urban nuclei	255
B On the shape of urban nuclei	255
2B On the size of urban nuclei	259
2A On the boundaries of urban nuclei	250
B On unbounded urban nuclei	260
2B On bounded urban nuclei	261
C On natural boundaries	261
2C On artificial boundaries	263
D On physical artificial boundaries	263
2D On artificial boundaries whether moral or imaginary	269

CHAPTER III

AN ANALYTICAL STUDY OF THE URBS – Preliminary Remarks

275

§ – I

ON URBAN ROADS OR STREETS

277

A	Layout of the streets	277
B	On the layout of urban roads or streets	278
C	On the horizontal layout	278
D	On the horizontal layout of urban roads, considered globally, as the starting point and terminus of the larger universal roadways	279
2D	The horizontal layout of urban roads, considered independently	282
3D	The horizontal layout of urban roads, with respect to their junctions and crossroads	286
2C	On the vertical layout of urban roads	290
D	Development of the vertical layout of urban roads, considered independently	291
2D	Irregularities in the vertical layout as compared to the horizontal layout	294
2B	The transverse profile of urban roads	297
C	On the width of urban roads	297
2C	Transverse slope of urban roads	300
3C	Form and distribution of the transverse profile	301
3B	Paving of urban roads or streets	302
4B	Underground (subsoil)	308
C	Drainage of rainwater and water for domestic and industrial use	308
2C	Fresh water supply systems	312
3C	Gas pipes for public and private lighting and electrical wiring for urbanization	314
5B	Above ground (suprasoil)	315
6B	Lateral and upper limits of urban roads or streets	319
C	On the lateral façades that border on urban roads, considered from the standpoint of their horizontal projection in plan along the length of the road	321
2C	On the lateral façades, considered in their vertical section transverse to the street	324
3C	On the upper boundaries of the street	328
2A	On urban roads or streets, considered from the point of view of their origin and destination	332
B	On transcendental urban roads or streets	335
2B	On strictly urban roads	338
3B	On private urban roads	340
4B	The connections between these different roads, within a single category, and from one to another	340
C	On the connections between transcendental roads	342
2C	On the connections between strictly urban roads	347
3C	On the connections between private roads	348
4C	Examination of the peculiar appearance resulting from the combination of these three road systems, which constitute the urban road network	349

§ – II

ON THE INTERVIAS OR SPACES ENCLOSED BY URBAN ROADS

335

A	On the intervias as a whole, and as the site for a small urbs	358
B	On the isolation of the intervias and the means that establish it	358
C	Transcendental circulation areas	359
2C	Local area or perimeter road around the intervias	360
3C	Perimeter enclosure	362

2B Effects and results of this isolation	363
C Form of the intervias	363
2C Size of the intervias	364
3C Position of the intervias	365
4C Orientation of the intervias	367
2A How the intervias are split	368
B On splitting the intervias by means of interior roads	369
C On the interior roads of the intervias, which run from one point to another along the periphery	370
2C On the internal roads of the intervias, which penetrate into them but do not cross through to another point on the periphery	372
3C Connections between interior roads and exterior roads	373
2B On the division of the intervias by means of building plots	374

§ - III

ON THE PLOT, CONSIDERED AS THE SITE FOR A HOUSE	377
A On the means of isolating the plot and its effects	379
B Form of the plot	380
2B Size of the plot	381
3B Position of the plot	381
4B Orientation of the plot	382
2A On how plots are split	382

§ - IV

ON THE FLOOR PLAN OF THE HOUSE	388
A On the plan of the house as a whole and as the site for the small-scale urbs/house	388
2A On the divisions to which the floor plan of the house is subject	390

§ - V

ON THE HOUSE UNDERSTOOD AS THE FAMILY DWELLING - IN OTHER WORDS, THE ELEMENTAL URBS	392
A On the simple or detached house/dwelling	396
B On the means, conditions and circumstances of isolation	397
C On the isolating area	398
2C Conditions of the isolating and surrounding wall	399
2B On the distribution of the isolated area	400
C Spaces destined to transit in the detached house	401
D Transcendental roads in the detached house	401
2D Local roads around the detached house	402
E On the layout and natural lighting of domestic routes, considered independently	403
2E On the layout of domestic roads in detached houses from the point of view of their meeting points and mutual links	404
2C Living spaces	405
D Rooms destined to the service of the collective	407
E Rooms dedicated to sustenance	407
2E Rooms dedicated to cleanliness	408
3E Rooms for social gatherings	409
4E Auxiliary quarters in the domestic network	411
2D Quarters intended for individual living areas	411

3B Subsoil, soil, roof and air space of the house	412
C On the subsoil of the house	413
2C On the floor of the house	414
3C On the roof and ceiling of the house	416
D On the roof of the house: its exterior structure	417
2D On the ceiling of the house	419
4C On the open volume of the house	420
4B Openings created or maintained in elevation, both interior and exterior	422
2A On a simple combined house	425
3A On housing, in complex combination	431
4A On the fragmentation of the dwelling or the confused combination of houses	433
<hr/>	
§ - VI	
URBAN INDICATOR, OR, IN OTHER WORDS, A CATALOG OF THE CONVENTIONAL DIVISIONS, NAMES, MEDIA AND SIGNS USED TO EXPRESS, DISTINGUISH AND DESIGNATE URBAN GROUPS AS A WHOLE, AS WELL AS EACH OF THEIR PARTS	443
A On the names of urban settlements, their divisions and the names used to designate the parts resulting from those divisions	445
B On the names corresponding to the greater urban settlement	445
2B On the names corresponding to suburbs	447
3B On the names corresponding to urbs taken on the whole	449
C On the common or generic names for urbs	450
D Customary meanings of the common or generic names for urbs	451
2D Origin and etymology of the generic or common names of urbs	456
2C On the proper names of urbs	483
D On the proper names of urbs, with origins in their foundation	485
2D On the proper names of urbs, stemming from the topography	490
3D On the proper names of urbs, stemming from historical, political, agricultural, or industrial considerations or importance	491
2A On the divisions adopted in urban areas and names and signs used to distinguish and denote each of the parts	494
B On the divisions, names and numbers referring to an urban enclosure	496
2B On the divisions, names and numbers referring to urban roads	502
C On the transverse divisions of urban roads and the names they are given	504
2C On the divisions of the urban road network in the longitudinal sense, and on the numbers and names with which the resulting parts are distinguished	507
D On the divisions to which roads are subject along their lengths	507
2D On the names corresponding to streets	510
E On the names of streets	510
2E On the proper names or individual names of streets	515
F On street names, from the standpoint of their meaning or object	516
G On street names with an absolute meaning	516
2G On street names with a relative meaning	520
2F On the proper names or individual names of streets, according to their origins	522
G On the proper names of street derived from popular use	522
2G On street names with their origins in the administration	525
3F On the attempts made recently by some administrations to systematize the nomenclature of streets.	527

3D On the names of the elements that are complementary to circulation, and features of the roads	531
3B On the divisions, names and symbols of the intervias	534
4B On the names and numbers associated with houses and their divisions	535
C Concerning generic names for the house	535
2C On the signs used to differentiate one house from another and to individualize them	538
D The history of the signing of houses	538
E The first period of signing – individualism and symbolic signs	539
2E Second period of signing – the authorities and numbering	541
2D Most recent systems of numbering and denomination: advantages and disadvantages	545
3C Concerning the names and signs of the various divisions of the house as a whole and in detail	547
D Concerning the names of the various superimposed layers of the house	548
2D Concerning the names and indications of the rooms making up the home	549
3D Concerning the names and indications of the access routes and all other auxiliary parts of the house relating to access, light and ventilation	551

§ – VII

THE LAWS OF URBAN FUNCTION	554
A On urban function, in relation to the intervias	557
B On urban function, from the standpoint of an individual's own quarters	558
2B On urban function, considered from the standpoint of the family home	560
3B On urban function, from the standpoint of the apartment building with respect to the different families that occupy it	563
2A On urban function, from the standpoint of roads	569
B On urban functions and roads and in the longitudinal sense	570
C On the function in the longitudinal sense of the road on the part of pedestrians	571
2C Urban functions occurring in the longitudinal sense of the road on the part of horses	575
2B On urban function from the standpoint of roads, and in the transverse sense	578
C On urban function in the transversal sense of the street, limited to the sidewalk	580
2C On urban function in the transverse sense of the street, as it affects the carriageway	588
3C On the urban function in the transverse direction of the street, when crossing from one side to the other	591
3B On urban function in the road and in the places where longitudinal and transverse movements occur simultaneously	593
3A External urban function	600
B On the external urban function, from the standpoint of the material necessities of the community	600
2B On external urban function, corresponding to expansion and communication	602
C On exterior urban function, whose purpose is recreation and leisure	602
2C On external urban function, whose purpose is communication	603
4A On the function of the administration in the urbs	605
B On the function of the administration in the streets	606
C On the function of the administration at ground level	607
2C On the function of the administration under ground	608
3C On the function of the administration above ground	609
B On the function of the administration in the intervias	614
3B On the function of the administration in places and purposes related to proper service of the population or residents of the urbs	616
C On the function of the administration with regard to public hygiene	617
2C On the function of the administration in places and purposes related to the domestic economy	620

3C On the administrative function, aimed at regularizing, protecting and harmonizing all other functions	623
--	-----

BOOK IV

HISTORICAL AND PHILOSOPHICAL REASONS

FOR THE NATURE OF OUR CURRENT URBANIZATION – Preliminary Remarks	627
--	-----

CHAPTER I

ON THE FORMATION OF URBS FROM THE POINT OF VIEW OF THE NEEDS OF EACH AGE, IN ACCORDANCE WITH THE MEANS OF LOCOMOTION AVAILABLE – Preliminary Remarks	631
--	-----

§ – I

ON THE FORMATION OF URBS IN THE AGE OF PEDESTRIAN LOCOMOTION	637
A On the formation of urban roads in the age of pedestrian locomotion	638
2A On the formation of urban intervias in the age of pedestrian locomotion	641
3A On the formation of the house in the age of pedestrian locomotion	646
4A On the formation of the urbs as a whole in the age of pedestrian locomotion	648

§ – II

ON THE FORMATION OF URBS IN THE AGE OF EQUESTRIAN LOCOMOTION	652
A On the formation of roads in the age of equestrian locomotion	652
2A On the formation of the intervias in the age of equestrian locomotion	656
B On the formation of the intervias of farming origin in the age of equestrian locomotion	657
2B On the formation of intervias of industrial origin in the age of equestrian locomotion	658
3B On the formation of intervias of trade origin in the age of equestrian locomotion	658
4B On the formation of intervias of military origin in the age of equestrian locomotion	659
3A On the formation of houses in the age of equestrian locomotion	659
4A On the formation of the urbs as a whole in the age of equestrian locomotion	661

§ – III

ON THE FORMATION OF URBS IN THE AGE OF LOCOMOTION BY DRAGGING	
A On the formation of urban roads in the age of locomotion by dragging	665
2A On the formation of intervias in the age of locomotion by dragging	666
3A On the formation of houses in the age of locomotion by dragging	667
4A On the formation of the urbs as a whole in the age of locomotion by dragging	667

§ – IV

ON THE FORMATION OF URBS IN THE AGE OF WHEELED LOCOMOTION	668
A On the formation of urban roads in the age of wheeled locomotion	669
B On the formation of urban roads in the age of wheeled locomotion, related to their horizontal layout	670
2B On the formation of urban roads in the age of wheeled locomotion, related to their vertical layout	670
3B On the formation of urban roads in the age of wheeled locomotion, related to their width and its distribution	671
2A On the formation of the intervias in the age of wheeled locomotion	673
3A On the formation of the house in the age of wheeled locomotion	673
4A On the formation of the urbs as a whole in the age of wheeled locomotion	675

CHAPTER II

THE RENOVATIONS AND TRANSFORMATIONS OF THE URBS IN THE TRANSITION FROM ONE AGE TO ANOTHER – Preliminary Remarks

677

§-I ON THE RENOVATIONS AND TRANSFORMATIONS OF THE URBS IN THE TRANSITION FROM PEDESTRIAN TO EQUESTRIAN LOCOMOTION

680

- A The renovations and transformations of urban roads in the transition from pedestrian to equestrian locomotion 680
 - B The renovations and transformations of the horizontal layout of urban streets in the first transition 681
- 2B On the renovations and transformations of the vertical layout of urban streets in the first transition 682
- 3B On the renovations and transformations of the width, distribution and other features placed on urban roads in the first transition 682
- 2A On the renovations and transformations of the intervias in the transition from the pedestrian to the equestrian age 685
- 3A On the renovations and transformations of the house in the transition from pedestrian to equestrian locomotion 686
- 4A On the renovations and transformations of the urbs as a whole in the transition from pedestrian to equestrian locomotion 688

§-II ON THE RENOVATIONS AND TRANSFORMATIONS OF THE URBS IN THE TRANSITION FROM EQUESTRIAN TO WHEELED LOCOMOTION

690

- A On the renovations and transformations of the urbs in the first period of the transition from equestrian to wheeled locomotion 691
 - B On the changes and transformations of the urban roads in the first period of the transition from equestrian to wheeled locomotion 693
 - C On the renovations and transformations of the horizontal layout of urban roads in that transition period 694
 - 2C On the renovations and transformations of the vertical layout of urban roads in that transition period 694
 - 3C On the renovations and transformations of the width, distribution and other features placed on the roads in that transition period 695
- 2B On the changes and transformations of the urban intervias in the first period of the transition from equestrian to wheeled locomotion 697
- 3B On the renovations and transformations of the house in the first period of transition from equestrian to wheeled locomotion 697
- 4B On the renovations and transformations of the urbs as a whole in the first period of transition from equestrian to wheeled locomotion 699
- 2A On the renovations and transformations of the urbs in the second period of transition from equestrian to wheeled locomotion 701

ON THE INTRODUCTION OF WHEELED LOCOMOTION INTO THE URBS

703

- B On the renovations and transformations of urban roads in the second period of the transition from equestrian to wheeled locomotion 706
 - C On the renovations and transformations of the horizontal layout in the second period 706
 - 2C On the renovations and transformations related to the vertical layout in the second period 708
-

3C	On the renovations and transformations related to the width, distribution and other features placed on the road in that second period	709
D	On the renovations related to the width of urban roads	710
2D	On the renovations related to the layout, shape and surface of urban roads.	715
3D	On all the other features placed on the road	717
2B	On the renovations and transformations of the intervias in the second period of transition from equestrian to wheeled locomotion	718
3B	On the renovations and transformations of the house in the second period of transition from equestrian to wheeled locomotion	720
4B	On the renovations and transformations of the urbs as a whole in the first period of transition from equestrian to wheeled locomotion	720
3A	On the economic means used to carry out urban renewal	723

CHAPTER III

ON THE RENOVATIONS AND TRANSFORMATIONS MADE TO THE URBS IN PREPARATION FOR THE TRANSITION FROM THE AGE OF ORDINARY WHEELED LOCOMOTION TO THAT OF ADVANCED WHEELED LOCOMOTION	727
--	-----

END OF VOLUME I

Acknowledgements	735
Credits	736
