

Mixed-Use Zoning and Home-Based Production in India



WIEGO Technical Briefs

The global research-policy-action network Women in Informal Employment: Globalizing and Organizing (WIEGO) Technical Briefs provide guides for both specialized and non-specialized audiences. These are designed to strengthen understanding and analysis of the situation of those working in the informal economy as well as of the policy environment and policy options.

This report was commissioned under the Inclusive Cities Project by WIEGO's Urban Policies Programme Director Caroline Skinner, who is based at the African Centre for Cities at the University of Cape Town.

About the Author:

Matt Nohn, a development economist and urban planning and policy expert, focuses on inclusive urban governance and the provision of land, infrastructure and housing in rapidly growing cities and the financing thereof. Since starting his professional career as a bricklayer, he has worked for international, public, private and citizen-sector organizations worldwide. In India, he has worked for the National Housing Bank, the Self-Employed Women's Association, Environmental Planning Collaborative and CEPT. He holds post-graduate degrees in Public Policy (Harvard), International Affairs (German Academic Merit Foundation) and Architecture and Planning (Technical University Darmstadt) and can be contacted at nohn@post.harvard.edu.

Acknowledgements:

The note is based on an unpublished working paper authored collectively by Matthias Nohn, Bimal Patel and Shirley Ballaney: Zoning Regulations For All: Efficient and Enforceable Nuisance, Density And Form Control Regulations Within A Larger Framework Of Building Better Cities By Developing And Financing Infrastructure Improvements For Gujarat's Towns And Cities.

Publication date: August 2011

ISBN number: 978-92-95095-37-3

Published by Women in Informal Employment: Globalizing and Organizing (WIEGO)
A Charitable Company Limited by Guarantee – Company No. 6273538, Registered Charity
No. 1143510

WIEGO Secretariat

Harvard Kennedy School,
79 John F. Kennedy Street
Cambridge, MA 02138, USA
www.wiego.org

WIEGO Limited

521 Royal Exchange
Manchester, M2 7EN,
United Kingdom

Copyright © WIEGO.

This report can be replicated for educational and organizing purposes as long as the source is acknowledged.

Cover photograph by: Martha Chen

Contents

Introduction	4
1. Origins of Land-Use Zoning and Early Mistakes	5
1.1 The Origin and Purpose of Zoning Regulations	5
1.2 Common Misconceptions of Land-Use Zoning Regulations.....	5
2. Considerations for a Reform of Zoning Regulations	8
2.1 A Reflection about the Original Purpose and the Real Impact of Regulations	8
3. Opportunities for Mixed-Use Zoning in India	11
3.1 Mixed-Use Zoning as a Means of Preventing Harm and Doing Good.....	11
3.2 Properly Defining Land-Use Zones.....	11
3.3 The Scale of Uses – An Often-Neglected Factor that Should Be Considered	11
3.4 A Revised Definition of Zones – Tentative Proposal	12
3.5 Relating the Proposed Zoning System with the Informal Economy and Home-Based Production.....	15
4. Conclusion.....	15
References	16
Appendix 1	17
Rule for the Self-Regulation of Home-Based Commercial and Manufacturing – Tentative Suggestion.....	17
Appendix 2	18
Different Methodologies for Zoning	18
Appendix 3	19
A Case Study from Ahmedabad, Gujarat, India.....	19

Introduction

This WIEGO Technical Briefing Note addresses land-use zoning regulations, both generally and specifically in India, and makes special reference to the impact of mixed-use zoning on home-based production. It also suggests a more efficient and more equitable approach to regulating land use that provides for the inclusion of home-based workers within the formal policy framework.

Overly strict separation of land uses (such as single-use zones) produces inefficient cities with expensive transportation, pollution and insecurity. Instead, it is necessary to promote a balanced mix of uses that fruitfully interact with each other. To be able to effectively exclude uses that may create an undesirable level of nuisances, it is furthermore important to distinguish not only land uses but also the scale of the uses – because, for example, a small tailor workshop may enrich a residential neighbourhood while a sewing factory may cause undue nuisance. Finally, distinguishing both land uses and the scale of uses allows to better address the needs of small-scale home-based and street-linked producing and commercial entities and, thereby, create an environment for poverty reduction. Based on the principles of subsidiarity and self-regulation, it may be advisable to let neighbours decide whether or not such activities are desirable in the neighbourhood.

This briefing note is not meant to be exhaustive; on the contrary, it even limits itself to key issues that are essential for structuring a debate around (i) how to improve India's regulatory zoning system and (ii) how to promote mixed-use zoning and home-based production in particular, with a focus on poverty alleviation.

To do so, the briefing note first takes a step back in order to reflect about the origin and purpose of zoning regulations. These reflections will provide the base for originally rethinking the challenges and opportunities associated with mixed-use zoning and its impact on home-based production, poverty alleviation and social welfare in India. Thereafter, the essay suggests one reform proposal (of many possible); a final section concludes.

1. Origins of Land-Use Zoning and Early Mistakes

1.1 The Origin and Purpose of Zoning Regulations

Zoning regulations originated in the late nineteenth and early twentieth century as a response to unsanitary living conditions in highly congested, rapidly industrializing European and North American cities. Since then, the most common objective of zoning regulations has been to separate incompatible uses in order to avoid, for example, the pollution of a residential area through a textile mill located within this residential neighbourhood.

In what is arguably the purest form of this separation, the 1928-founded Congrès International d'Architecture Moderne (CIAM; in English "International Congress of Modern Architecture") advocated separating (seemingly) conflicting uses, strictly dividing the city into four different functions: living, working, recreation and transportation.¹ (But even in the case of CIAM cities – such as Chandigarh in India or Brasilia in Brazil – residential sectors were actually mixed-use neighbourhoods; see picture of Chandigarh on page 7.) Even today, more than 75 years later, experts, politicians and laymen alike are fascinated by the idea of building clean and orderly cities according to CIAM's or a similar formula that separates (apparently) incompatible uses.

Other common objectives include (i) density control: in India maximum plot coverage and floor space ratios are prescribed, often; (ii) form control: in India, building height, road setbacks and side margins are prescribed, often; (iii) though not common in India, the prescription of mixed-income residential zones may be another objective that is especially interesting with respect to urban poverty alleviation and equitable development issues. For a case study on the latter objective see, for example, the Riesefeld development in Freiburg, Germany. However, in many cases these regulations impose higher costs than benefits to society. The problems created through such failures – such as the loss of social welfare and the exclusion of the urban poor – are discussed below (Berke et al. 1995; Parolek et al. 2008).

1.2 Common Misconceptions of Land-Use Zoning Regulations

Over time it has become evident that the costs imposed through zoning regulations too often exceed the benefits. While the original idea – i.e., the separation of incompatible uses – remains valid, the overly strict separation of virtually *all* uses, regardless of the potential benefits that the mix of *some* uses may provide, imposes very high costs that require the rethinking of our approach to zoning today. For example, a society that separates all uses is forced to make many more – and more distant – commutes than a society living in mixed-use cities. This results in a loss of working/leisure time, environmental pollution, higher transportation costs, reduction in disposable household income, greater demands on the transportation system and, thus, higher public spending.

Jane Jacobs dedicated a full chapter to this vicious cycle in her groundbreaking book *The Death and Life of Great American Cities* (1961). Under strict separation of uses, it is necessary to make many trips per day. In fact, each time the daily routine shifts from housing to schooling, from schooling to working, from working to shopping, from shopping to schooling, from schooling to recreational, from recreational to housing, and so forth, a new (at least medium-distance) trip is likely necessary to relocate from one zone to the other. The high number of trips increases the demand on our

¹ In the 1933 Athens-based conference The Functional City (CIAM IV), participants developed the so-called Charta of Athens. This highly influential international document insisted cities should be built separating four functions: (i) living (today residential, potentially, including small-scale commercial); (ii) working (today manufacturing as well as [large-scale] office and retail commercial); (iii) recreation (today institutional, public spaces and, potentially, commercial); and (iv) circulation (today transportation such as road space, railways and stations, etc.).

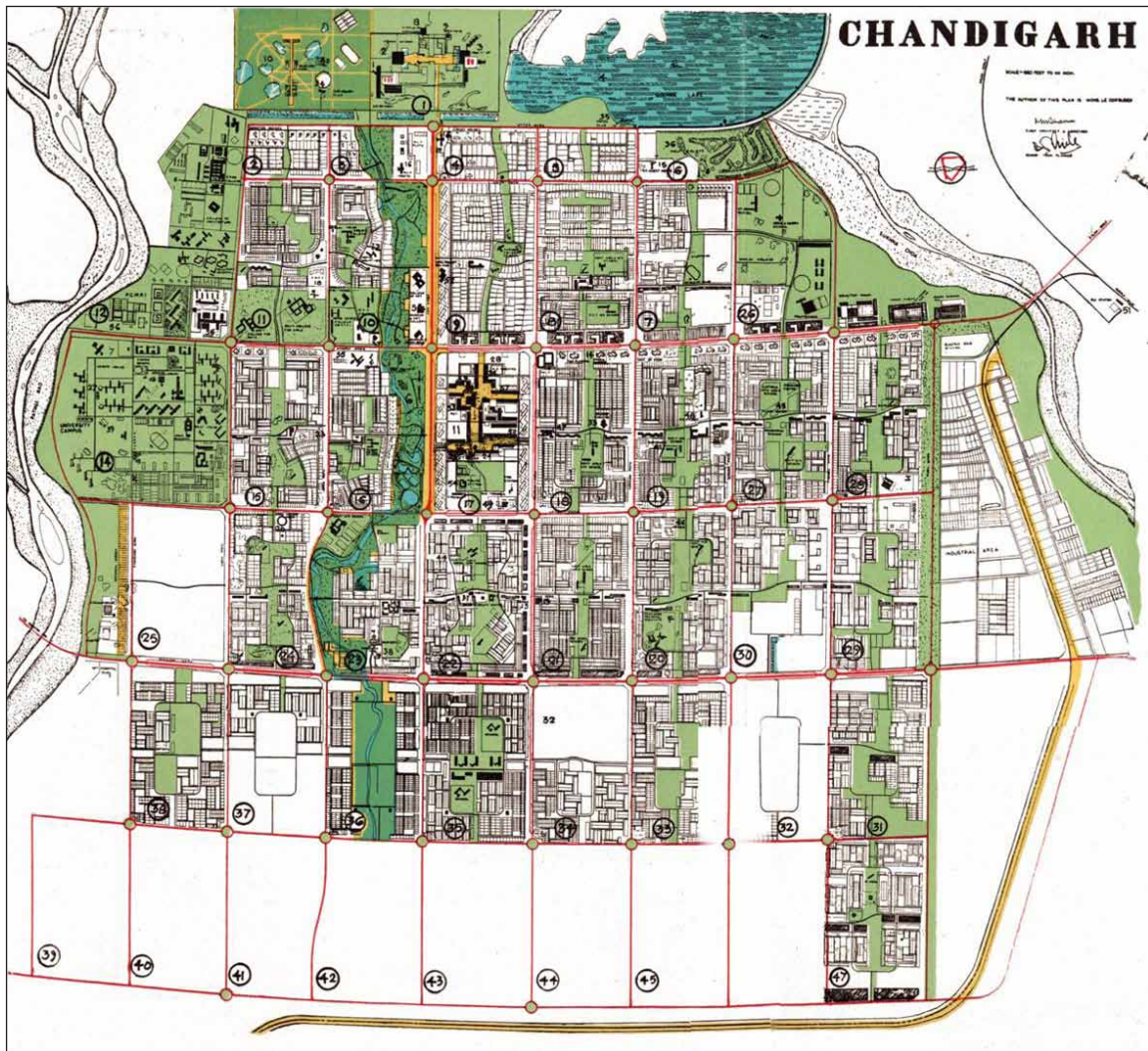
transportation systems. In turn, cities demand larger and larger roads, which consume land and, thus, reduce built-up densities. This in turn requires longer and more frequent trips – because (i) lower density requires longer trips to reach the same number of facilities, and (ii) walking becomes a less likely option – which in turn requires more and more roads. In addition, people lose time and money (for fuel or tickets) and pollution increases.

This way, (traditional) land-use zoning (that separates virtually all uses) achieves the very opposite of the original objective, i.e. the control of nuisances. As all of us know today, the nuisances reinforced through use-separation belong amongst the most pressing challenges of our age: traffic congestion eats into the time we could otherwise spend with families and friends or on work; air pollution deprives our health; and in light of the effect of greenhouse gases, emissions are both a local and a global problem, etc.

The Indian planner Dr. Ashish Nangia observes:

That Chandigarh has not developed as planned, at least in some ways, is a reflection of the limitations of architecture and urban planning as tools to engineer social change on the one hand, and inherent flaws in the master plan on the other. Firstly, the Chandigarh plan assumes that human activity can be regulated just as a city plan can be on paper, by division into rigid zones of work, living and leisure. This is a form of assumed social control that is difficult, if not impossible, to enforce in a democratic country. It is difficult to class people into neat categories, and equally difficult to categorize human activity and imagine that it will not change over time. While making ample provision for the classes of people the city was originally meant for – administrators and bureaucrats, politicians and refugees – the Chandigarh plan made very little concession towards the people who actually ran the city – the sweepers and the rickshawallas, the street vendors and the hawkers, the construction workers and the hired labour. It is these people and their daily business that fills up the interstices of the city – the spaces which are no-man's land, which belong in principle to everyone and thus to no-one. In its inherent arrogance, the Chandigarh plan failed to provide space for the very people without whom the city could not be run as a functioning organism.

(Nangia 2004)

Figure 1: Le Corbusier's Original Master for Chandigarh.

The plan clearly delineates Chandigarh's many sectors, most of which are predominantly residential (but actually mixed-use) zones – besides other sectors for office/government and commerce, etc. (Retrieved from <http://landlab.wordpress.com/2011/04/08/qt8-chandigarh-la-martella/>)

Though not the focus of this briefing note, it should be mentioned that not only land-use zoning but also many other types of zoning impose very high costs on society. For example, floor space ratios reduce the supply of built-up area and thereby increase the market-clearing price of housing significantly – which forces even Indian middle-income households to live in apartments that are so small, the United Nations (UN) tends to qualify them as slum dwellings. Of course, the urban poor do not have any other choice than to “opt” for living in informal settlements that avoid impermissible regulatory costs. Another example is the requirement of margins, resulting in wasteful underutilized areas while forcing development to go up. This, in turn, requires stronger structures and thus drives up the cost of development. Or, the requirement to build with more expensive materials contributes to creating “exclusive zones” for the rich and powerful. Finally, the requirement to provide for car parking – even in low-income housing projects – subsidizes car drivers at the expense of low-income households that might never own a car: in fact, the requirement to provide open space for parking tends to diminish the coverable plot area and, thereby, also forces development to spread further out; see the above discussion on margins.

2. Considerations for a Reform of Zoning Regulations

2.1 A Reflection about the Original Purpose and the Real Impact of Regulations

Amongst many other important objectives, regulations should maximize social welfare by promoting economic efficiency and ensure a decent level of social and economic equity. For the case of zoning regulations, finding the cost-benefit equilibrium is closely related to balancing two rivalling objectives: to prevent harm versus to promote good:

1. **To prevent harm by separating the uses, which negatively affect each other.** This is a commonly accepted practice and its origins have already been discussed above.
2. **To do good by promoting diverse neighbourhoods with a mix of uses that fruitfully interact with each other.** Standard examples for such a fruitful interaction are (small-scale) convenience commercials or a kindergarten within a residential zone.

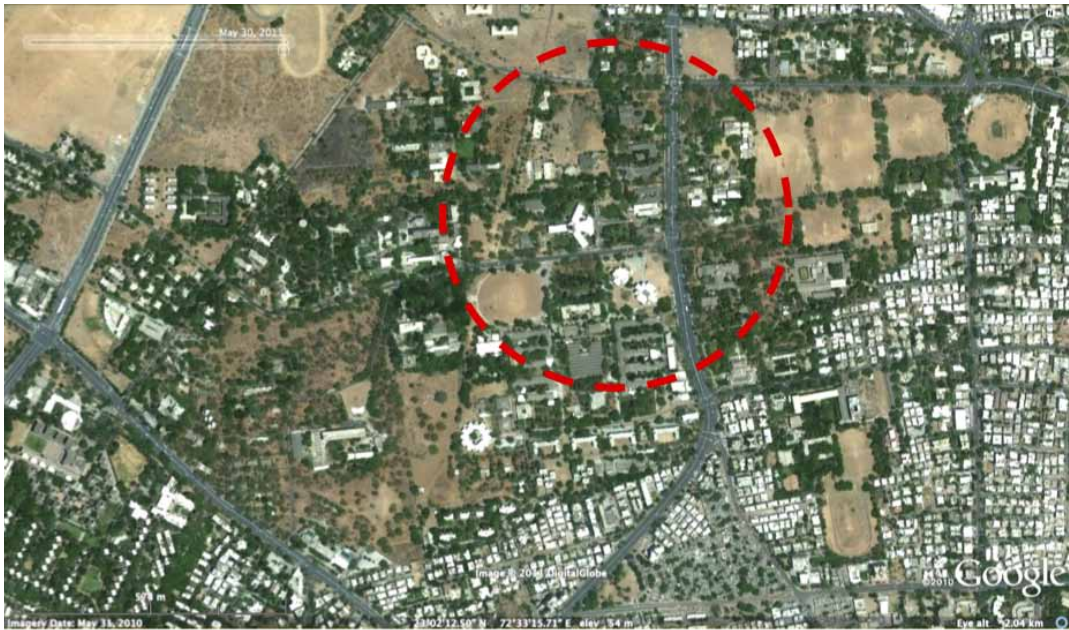
The *need for balancing* both objectives shall be illustrated with two extreme examples: the single-use educational zone around Gujarat University in Ahmedabad and the mixed-use larger Harvard University campus. This is an interesting comparison because in both cases the main activity that takes place in the area is academic teaching and research – but with respect to land use and physical appearance, both cases could not be more different.

The zoning impact on both university areas is summarized in the following table; in addition, both cases are depicted with a Google Earth image on the next page. Finally, this section concludes with a generalizing cost-benefit graph of separating versus mixing different land uses and scales of uses.

Table 1: The Impact of Zoning on Gujarat and Harvard University Areas

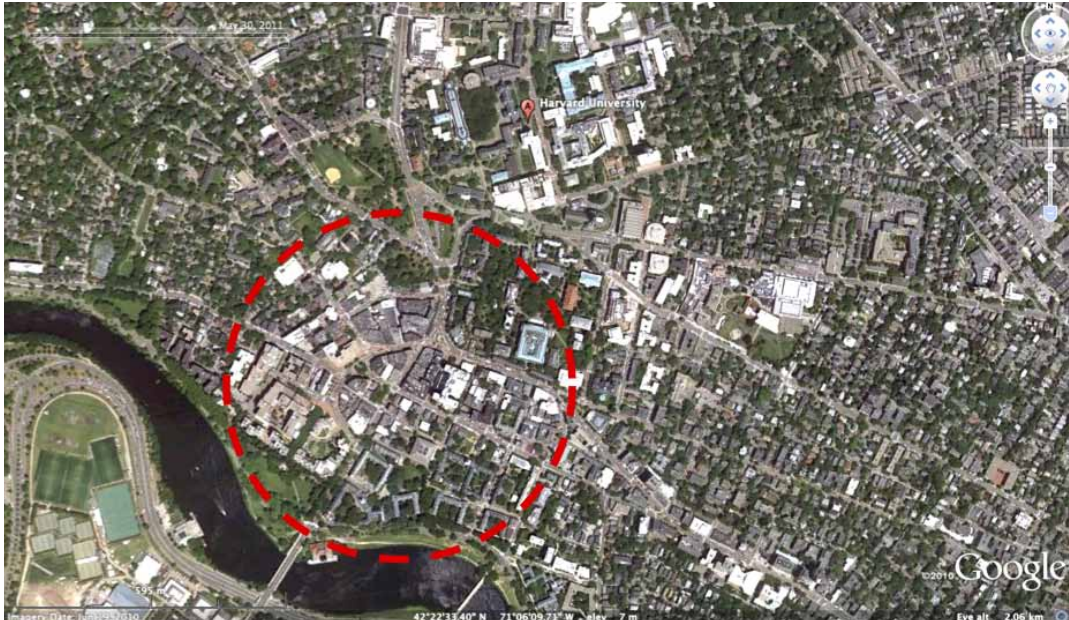
Case	Gujarat University	Harvard University
Zoning	<ul style="list-style-type: none"> • Single-use zone • Low-density zone 	<ul style="list-style-type: none"> • Mixed-use • High-density
Costs	<ul style="list-style-type: none"> • The remoteness of other uses increases the number and distance of motorized trips. • This contributes to traffic congestion. • It also fuels energy consumption, raises fuel costs and increases pollution. • It increases time spent in traffic, thus reducing working and/or leisure time. • Security is a concern. 	<ul style="list-style-type: none"> • Students need to accept (very limited) nuisance from other land uses; other land uses need to accept (very limited) nuisance from students.
Benefits	None – the overly ambitious restrictions only impose costs.	<ul style="list-style-type: none"> • Land and infrastructure may be put to the most valuable (permitted) use. • Efficient synergies between the different uses take place: e.g., the subway station is used for commercial during the day and for leisure at night. • Land values increase due to higher-value uses and synergies • Property tax revenues increase.

Figure 2: Single-Use Educational Zone at Gujarat University, Ahmedabad, Gujarat, India



Source: Google Earth © 2011 – This satellite image shows a single-use zone that suffers from, among other things, underdevelopment (low density), insecurity (no eyes on the street outside of academic core hours) and excessive demands on transportation. (Encircled is the area around GU's main gate.)

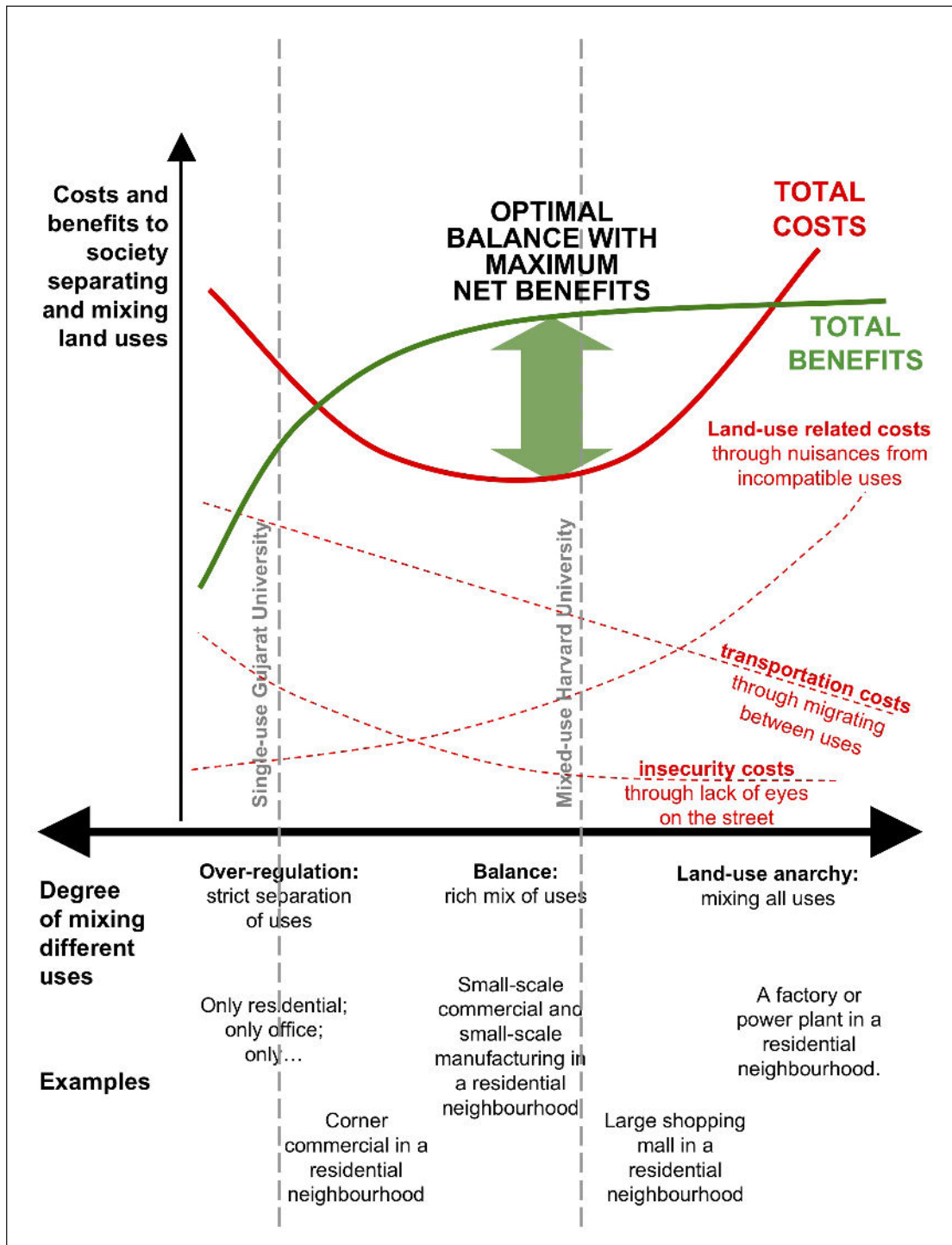
Figure 3: Mixed-Use Zone at Harvard University, Cambridge, MA, USA



Source: Google Earth © 2010 – This satellite image shows a mixed-use zone that flourishes through a rich mix of activities. It offers high density, relative safety (the diverse set of uses promotes eyes on the street 24/7) and accessible public transportation, even though most trips can be done by walking between the highly concentrated set of uses. Note that the rich (literally) mix of land uses and activities is one of the key reasons why Harvard, owning a major share of this valuable land, is the richest academic institution in the world. (Encircled is the area around Harvard Square.)

Based on empirical evidence, both from India and abroad, the costs and benefits of separating versus diversifying various land uses can be generalized with the following cost-benefit analysis graph:

Figure 4: Costs and Benefits from Separating and Mixing Land Uses



The more diverse the land uses that exist in a neighbourhood, the more likely there will be a fruitful interaction amongst them; however too many different uses in the same area may negatively affect each other. The optimal solution is to mix highly compatible uses, which provides the largest net benefits. On the contrary, a neighbourhood containing only one use (that is segregated from all others) tends to be inefficient—even though this area enjoys a lesser degree from land-use related nuisances—because there are no synergies between different uses and transportation costs and insecurity are likely high.

3. Opportunities for Mixed-Use Zoning in India

3.1 Mixed-Use Zoning as a Means of Preventing Harm and Doing Good

As conceptualized above, to find the right (or balanced) combination of land uses that fruitfully coexist, instead of negatively affecting each other, is desirable because it maximizes social welfare.

Until the 1970s, the separation of different uses dominated international zoning policies. However, not only industrialized countries but also India have since started to promote mixed-use developments for its higher efficiency. In fact, the modern planning point of view of promoting mixed-use neighbourhoods is today increasingly endorsed amongst Indian planners. For example, Delhi's recently published Street Design Guidelines promote high-density mixed-use neighbourhoods.²

Additionally, despite the existence of some inefficient and even dangerous “single-use” districts in Indian cities – such as the educational zone of Ahmedabad or the more recent Banda Kurla office complex in Mumbai – India has a strong advantage with respect to mixed-use zoning when compared with Western European and North American countries. This is not despite but because of the large share of informal activities that co-exist with formal ones in Indian cities. This co-existence reflects the fruitful symbiosis between many different uses, be they formal or informal. Therefore, when discussing any improvement of current zoning regulations in India, the needs and priorities of the informal economy and its workforce must be addressed. Otherwise, a large share of the population would unnecessarily (continue to) be excluded and economic growth would (continue to) be constrained.

Now, the question is no longer whether or not mixed-use zoning is good but how the increasing influence of mixed-use zoning can be strengthened and how the informal economy can be included.

3.2 Properly Defining Land-Use Zones

As already described above, traditional zoning systems tend to distinguish residential, commercial (sometimes further divided into offices and retail) and manufacturing. Often planners add the category of “institutional” uses, which may include education (e.g. universities), health (e.g. hospitals) and administrative (e.g. police headquarters or military) units. There is nothing wrong with the underlying rationale for this distinction so that it remains valid; however, it misses another key issue for considering the nuisances caused by various activities: the scale of land uses.

3.3 The Scale of Uses – An Often-Neglected Factor that Should Be Considered

The scale of uses is a very important consideration because the nuisances and benefits of, for example, a small-scale corner commercial venture such as a vegetable vendor who caters to the residents of a street creates virtually no nuisance, while providing large benefits to the neighbourhood; see discussion on the advantages of mixed-use zoning above. However, it would be understandable if local residents opposed the opening of a large-scale retail store or vegetable market on their small street, which would attract traffic from all over the city and produce large amounts of organic waste that could attract vermin.

In sum, while the traditional distinction between residential, commercial, manufacturing and possibly institutional makes basic sense, the scale of a use is at least as important as the use itself. A corner commercial venture in a residential neighbourhood which all residents (including little children and the elderly) can walk to in order to purchase daily goods makes complete sense; a large retail store much less

² See UTTIPEC (2010), page 20.

so. A small tailor's workshop in a residential neighbourhood makes sense, too, especially if the tailor lives there herself – but the small-scale workshop in a local home is completely different from a sewing factory.

Thus, intelligent zoning must make reference to permissible activities based on both the use and its scale.³ A tentative definition of activities to be mixed or separated in various zones could be:

1. Environmentally-friendly residential – with low density and low plot coverage; to be used in environmentally sensitive areas at the urban periphery only
2. Regular residential – with similar physical features as many current middle and upper-income residential zones
3. Intensive residential – with similar physical features as many dense walled cities, chawls and informal settlements
4. (Small-scale) home-based commercial – of not more than 100 square meters, run by a resident in his/her home⁴
5. (Small-scale) street-linked commercial – of not more than 100 square meters, run on the ground floor or ground+1⁵
6. Large-scale commercial – with commercial institutions of any size such as malls
7. (Small-scale) home-based production – of not more than 100 square meters, run by a resident in his/her home⁶
8. (Small-scale) street-linked production – of not more than 100 square meters, run on the ground floor⁷
9. Light manufacturing – low pollution factories such as a printing workshop
10. Heavy manufacturing – high pollution factories such as a power or steel plant
11. Small-scale institutional – such as a small kindergarten⁸
12. Medium-scale institutional – such as a primary school of medium size⁹
13. Large-scale institutional – such as a large college

3.4 A Revised Definition of Zones – Tentative Proposal

In order to maximize social welfare it is necessary to, as discussed above, prevent harm by separating the land uses that are incompatible with each other and to, simultaneously, do good by promoting the mix of uses that create synergies. However, this is trickier than one may initially think: as all citizens are individuals with truly individual (and thus differing) perceptions about (i) the nuisance and benefits associated with particular uses and (ii) the acceptable (or desirable) maximum nuisance level, any zoning system suitable for a democracy should offer choices: i.e. a range of zones that vary by the maximum nuisance level allowed and thus, by the number and intensities of permissible uses mixed in such a zone.

³ To distinguish activities not only by their “use” but also by the “scale” of that use is a strategy that may also aid in reducing the negative effects of a deregulated land-use market, with rising land values. It would allow the exclusion of large-scale commercial from mixed-use areas while small scale (including home-based production) activities may take place in that area so that significant synergies will arise (so that land values will increase, but not as much as in a completely “unregulated” but also unprotected zone).

⁴ Should be allowed only if the neighbours do not object because if the neighbours do not mind (or are compensated for minor inconveniences) then there are only benefits but no relevant nuisances/costs.

⁵ Same as note 4, above

⁶ Same as note 4, above

⁷ Same as note 4, above

⁸ *Small* may be defined as, e.g., of not more than 500 square meters built-up area across adjacent plots.

⁹ *Medium* may be defined as, e.g., not more than 2,500 square meters built-up area across adjacent plots.

The following page displays a table with a list of zones that would fulfil this requirement. The proposed system's main goal is to increase the predictability of the nuisance intensity in a zone by applying two basic principles:

1. to define a maximum permissible nuisance level for any particular zone
2. to allow *all* activities that do not exceed this level in this zone.

The table on the following page summarizes which of the 12 activities are allowed in any zone. For example, the environmentally-friendly residential zone (E) guarantees an extremely low nuisance level to its users. However, the benefit of very low nuisance does not come without cost: to achieve the low nuisance level, most uses and scales of uses are prohibited. In fact, only environmentally-friendly residential, home-based small-scale commercial ventures run by a resident (provided that a critical mass of neighbours does not object) and small-scale institutions such as a kindergarten are allowed in the zone. In sum, in environmentally-friendly residential areas, the nuisance level is very low but, to achieve this, the individual freedom of users in that zone must be constrained.¹⁰

On the other hand, the light manufacturing permits a significantly higher nuisance level but, much less so, restricts the opportunities of its users to choose the use and the scale of use that maximizes their personal happiness – or utility, as economists would say. (In fact, in light manufacturing zones, nearly everything is allowed.)

Explanatory digression: any activity with a nuisance intensity that is *lower* than the maximum nuisance defined in a zone *should be allowed* to locate in that particular zone; therefore, low nuisance activities are free to locate nearly anywhere while higher nuisance activities are more restricted. This flexibility for low-nuisance activities makes sense because restricting, for example, small-scale commercial ventures (that neighbours do not oppose) would only unduly restrict their individual freedom while not providing any significant benefits to higher-nuisance activities.

¹⁰ This would not be an undue restriction because it is, in general, a person's free choice to reside in or come to and visit any zone – be it a zone with higher degree of freedom of use and scale of use, or be it a zone with lower level of nuisance.

Table 2: Land-Use Zones by Nuisance Intensity Cross-Tabulated with Activities (Uses and Scale of Uses) by Nuisance Intensity

Land-Use Zone by Nuisance Intensity	Activities (Use and Scale of Use) by Benefit-Adjusted Nuisance Intensity												
	Decreasing Nuisance Intensity →						← Increasing Nuisance Intensity						
	Environmentally-Friendly Residential	(Small-Scale) Home-based Commercial	Small-Scale Institutional	Regular Residential	(Small-Scale) Street-Linked Commercial	(Small-Scale) Home-Based Production	Medium-scale Institutional	Intensive Residential	(Small-Scale) Street-Linked Production	Large-Scale Institutional	Large-Scale Commercial	Light Manufacturing	Heavy Manufacturing
Environmentally-Friendly Residential (Very low nuisance)	✓	✓*	✓	✓	✓*	✓	✓	✓	✓	✓	✓	✓	✓
Regular Residential (Low nuisance)	✓	✓*	✓	✓	✓*	✓	✓	✓	✓	✓	✓	✓	✓
Intensive Residential (Moderate nuisance)	✓	✓*	✓	✓	✓*	✓	✓	✓	✓*	✓	✓	✓	✓
Commercial (Medium nuisance)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Light Manufacturing (High nuisance)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heavy Manufacturing (Very high nuisance)			✓*		✓*				✓*			✓	✓

* Note: this use should be allowed unless a critical mass of neighbours objects; see Appendix I.

3.5 Relating the Proposed Zoning System with the Informal Economy and Home-Based Production

In urban India, 8 per cent of male urban workers, 25 per cent of female urban workers, and 12 per cent of all urban workers are home-based. Furthermore, in the manufacturing sector in urban India, 18 per cent of male workers and 77 per cent of female workers are home-based.¹¹ In addition, there are many more home-based but especially street-linked commercial units in residential areas. Therefore, unless home-based production and small-scale commercial is zoned as a permissible use in residential areas, overly restrictive zoning regulations would automatically stigmatize far more than 12 per cent of urban workers as informal, if not illegal – subjecting them to various forms of socioeconomic exclusion and exploitation. For example, informal businesses tend to be excluded from access to affordable financial capital, even though they might be highly profitable; microcredit is built around this gap in the formal value chain. Or, informal producers are more often required to pay bribes in order to be “allowed” to continue their business.

Therefore, it is important to formally recognize the activities of home-based production and small commercials and to include them as permissible uses in other zones, especially residential. However, since it may be hard to define precisely which home-based production activities are non-hazardous (and thus should be generally permitted) it is possible, even likely, that such a generous general permit may be exploited or abused. Based on the latter rationale, it may be difficult to convince policy makers to implement zoning regulations that permit home-based production and small-scale commercial in general without any preconditions.

Self-regulation of home-based production and small-scale commercial activities in lower nuisance zones may effectively respond to this policy challenge. Here the principle of subsidiarity may be applied because nobody else than the direct neighbours of a home-based producer knows better whether or not this activity poses an undue nuisance on a neighbourhood. Therefore, the direct neighbours may be assigned the powers to allow or shut down any facility. Appendix I provides a tentative suggestion how this may work. (Even though this suggestion is admittedly imperfect, it is arguably much better than rendering home-based production and small-based commercial businesses informal.)

4. Conclusion

Overly strict separation of uses (such as single-use zones) produces inefficient cities with expensive transportation, pollution and insecurity. Instead, it is necessary to promote a balanced mix of land uses that fruitfully interact with each other. To be able to effectively exclude those uses that may create an undesirable level of nuisances it is furthermore important to distinguish not only land uses but also the scale of the uses. This is important because, for example, a small tailor workshop may enrich a residential neighbourhood while a sewing factory may cause undue nuisance. Finally, distinguishing both land uses and the scale of uses allows society to better address the needs of small-scale home-based and street-linked production and commercial entities; based on the principles of subsidiarity and self-regulation, it may be advisable to let neighbours decide whether or not such activities are desirable in the neighbourhood.

¹¹ 2004-2005 National Sample Survey data from India tabulated by G. Raveendran and analyzed by Marty Chen for the WIEGO network, under the Inclusive Cities project.

References

Berke, Philip R. and David R. Godschalk. 1995. *Urban Land Use Planning*, University of Illinois Press.

Parolek, Daniel G., Karen Parolek and Paul C. Crawford. 2008. *Form-Based Codes*. Hoboken, NJ: John Wiley and Sons.

Nangia, Ashish. 2004. "The City of Chandigarh – II." Urban planning weblog on Boloji.com. Available at <http://www.boloji.com/index.cfm?md=Content&sd=Articles&ArticleID=1016> (accessed July 1, 2011).

Unified Traffic And Transportation Infrastructure (Planning & Engineering) Centre (UTTPEEC). 2010. *Street Design Guidelines "...for Equitable Distribution of Road Space."* Delhi Development Authority, New Delhi. Available at <http://www.uttipeec.nic.in/StreetGuidelines-R1-Feb2011-UTTPEEC-DDA.pdf> (accessed July 1, 2011).

Patel, Bimal, Shirley Ballaney and Matt Nohn. 2009. *Zoning Regulations for All: Efficient and Enforceable Nuisance, Density and Form Control Regulations Within a Larger Framework of Building Better Cities by Developing and Financing Infrastructure Improvements for Gujarat's Towns and Cities*. Unpublished working paper, Environmental Planning Collaborative, Ahmedabad, India.

Appendix 1

Rule for the Self-Regulation of Home-Based Commercial and Manufacturing – Tentative Suggestion

- (1) Small-scale home-based commercial and manufacturing facilities shall be allowed on any floor, provided that *all* of the following preconditions apply:
 - (i) The facility is run by a resident him/herself.
 - (ii) On plots with at least 20 (e.g. apartments or small-scale commercial) units owned by different landlords, not more than 50 per cent of unit owners object to running the facility on the plot.
 - (iii) On plots with less than 20 units owned by different landlords, not more than 50 per cent of unit owners that are direct neighbours (on adjacent, tangential and opposite plots) object to running the respective facility.
 - (iv) Provided that the entrepreneur is not the landlord of the real estate where the facility shall be operated, he needs the landlord's permission, too.

- (2) An entrepreneur who wants to run such a facility may either:
 - (i) Assume the necessary agreement. However, if either the unit owner (different from the tenant entrepreneur) or the critical mass of 50 per cent of owners objects at a later point in time, the entrepreneur shall shut down the facility immediately and shall not be compensated for any potential losses.
 - (ii) Obtain written consent from at least 50 per cent of direct-neighbours (see paragraph 1) to hedge the business investment. Unless different terms are specified, the agreement shall be legally binding for a period of 10 years. The valid term of the initial agreement shall not exceed 20 years. Thereafter, the agreement may be terminated with a legal period of notice of two years.

- (3) In the event of changing ownership, the following would apply:
 - (i) If the ownership changes from one landlord to another and if the former landlord has signed any agreement permitting the operation of a home-based small-scale commercial or production entity, then the agreement shall be binding on the new landowner. It is the obligation of the former owner to inform the new owner before the change of ownership; in absence of the information, the new owner may demand compensation from the former owner, but not from the commercial operator.
 - (ii) If the ownership changes from one landlord to another and if the former landlord has operated a home-based small-scale commercial entity, then any agreement that has been signed by other renting or owning neighbours in favour of the commercial operation shall continue in favour of the new landowner, provided that the commercial operation continues the same.

Appendix 2

Different Methodologies for Zoning

The difficulties when discussing zoning or a possible reform thereof do not end with the definition of zones and the activities permissible therein. It is also important to decide how zoning should be applied. There are basically three different options: plot-based, street-based and block-based zoning.

1. Plot-based zoning (also referred to as spot-zoning)

Here a particular use (as well as other parameters such as density, form or materials) are assigned for each plot, individually. If well done, it provides the largest opportunities, but it is also more time consuming and requires better technical skills, which might not be available at scale. Also it is difficult to foresee future market demand and supply of land uses so that assigning these for individual plots too often creates mismatches – unless “mixed-use” is assigned to a large share of plots (which would be a contradiction to “spot-zoning,” which seeks to be more specific.) However, if poorly implemented, this approach also produces the worst results. Finally, it opens the door for corruption because public officials with the power to assign certain characteristics decide on large differentials in property values. For these reasons, this approach ought to be avoided in India.

2. Street-based zoning

With this methodology, all plots bordering a particular street fall under the jurisdiction of one zone. It may be that zones are assigned to individual streets on a case by case basis or, as we will see in the case study of Ahmedabad below, depending on certain generic characteristics such as the street width, which may be a good proxy.

3. Block-based zoning

Finally, block-based zoning defines smaller blocks (delineated by adjacent streets) or larger neighbourhoods (delineated by adjacent arteries) or even city districts (delineated by important frontiers such as railways, rivers or ring roads, etc.). Block-based zoning tends to be the most pragmatic approach because it offers (i) clear delineations and (ii) a lesser distortion in property values between adjacent plots (thus limiting the scope for corruption). It is also the approach to zoning that comes closest to the actual origin of the term zoning, as it creates real two-dimensional zones, as opposed to spot-zoning and street-based zoning.

Appendix 3

A Case Study from Ahmedabad, Gujarat, India

The following pages first describe the current zoning regime in Ahmedabad, Gujarat, India and then show the application of the alternative zoning system proposed in the main paper. This information is directly taken from an unpublished working paper.¹² For related questions, please contact Ahmedabad-based planners Bimal Patel (bimal@hcp.co.in) and Shirley Ballaney (shirley@hcp.co.in) who know the zoning regime in depth through their day-to-day work.

Content¹³

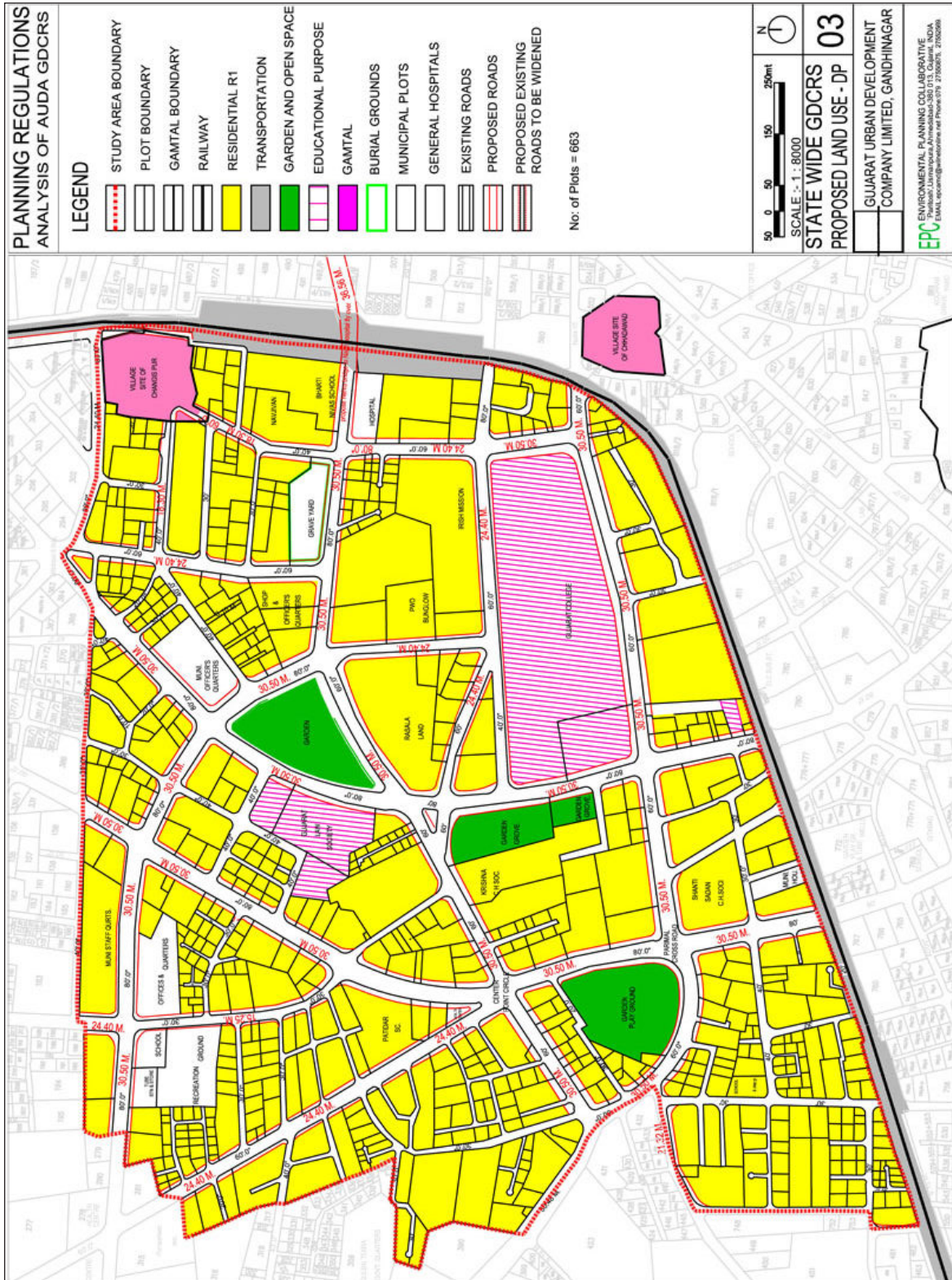
Map 1: Zoning According to the 2002 Development Plan in the Study Area	21
Map 2: Zoning According to Both the Current GDCR and the 2002 Development Plan	22
Map 3: Existing Land Uses Identified	23
Map 4: Dividing the Study Area into “Blocks” for the Purpose of Zoning.....	24
Map 5: Assigning “Preliminary Zones” to Each Block Within the Study Area.....	25
Map 6: Assessing Existing Height and Bulk on the Plots	26
Map 7: Assigning “Final Zones” Based on Larger Planning Objectives	27
Map 8: Assigning Detailed Zones According to Street Width.....	28

¹² Bimal Patel, Shirley Ballaney and Matt Nohn. Zoning Regulations for All: Efficient and Enforceable Nuisance, Density and Form Control Regulations Within a Larger Framework of Building Better Cities by Developing and Financing Infrastructure Improvements for Gujarat’s Towns and Cities. July 2009 (current draft).

¹³ Graphic credit: all maps have been composed by Archana Kothari, Environmental Planning Collaborative.

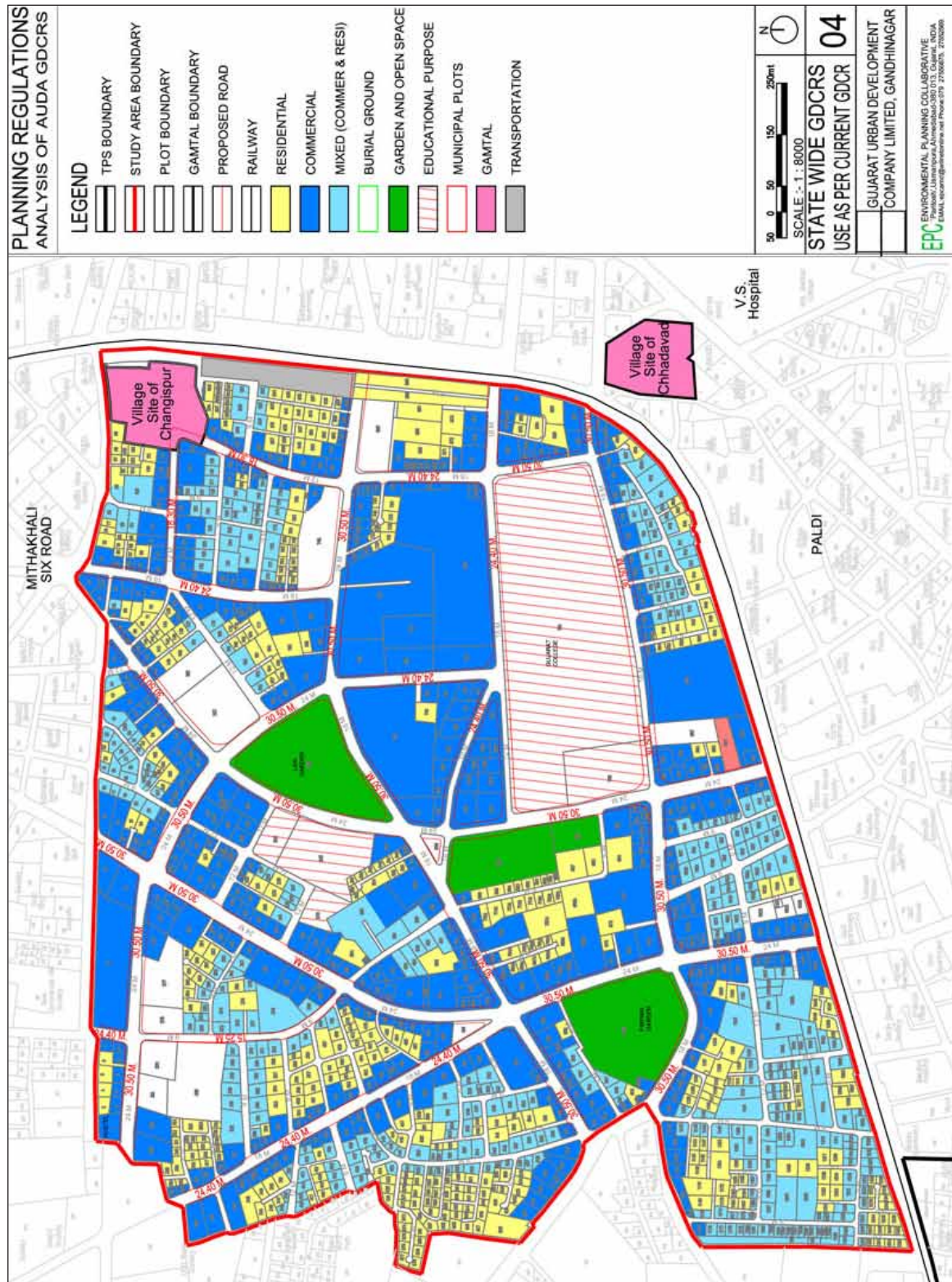
Map 1: Zoning According to the 2002 Development Plan in the Study Area

The official map basically shows residential with some educational and green spaces and some plots that are not “zoned” but “reserved” for other institutional uses—such as a hospital, schools or municipal offices.



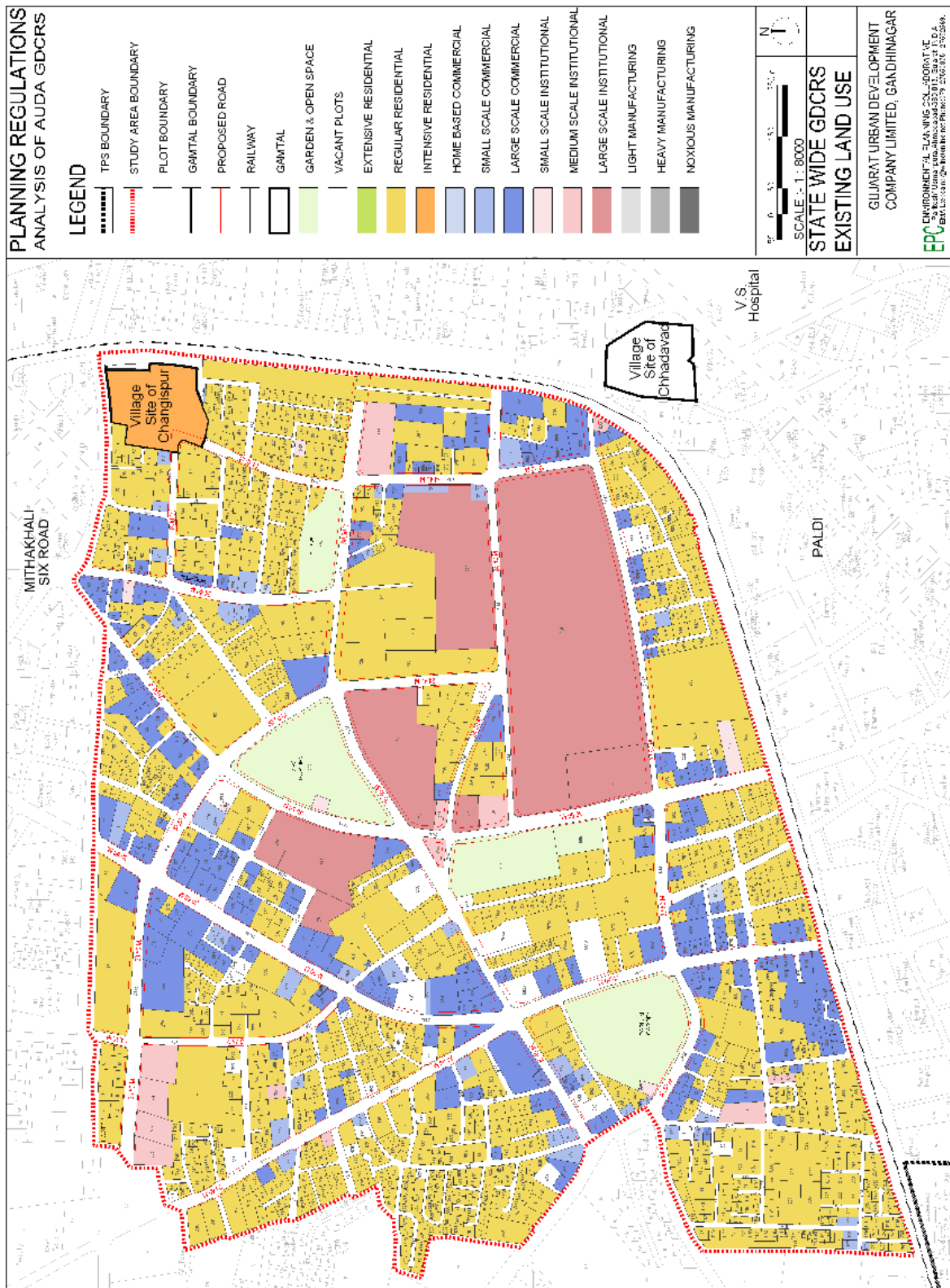
Map 2: Zoning According to Both the Current GDCR and the 2002 Development Plan

However, Section 12.1 (B) of Ahmedabad’s General Development Control Regulation (GDCR), a set of regulations complementary to or overriding the DP, varies the land use by street width: plots on streets of at least 18 meters width may be fully commercial; plots on streets of at least 12 but less than 18 meters width may have commercial in the ground and first floor, plots on streets of at least 9 but less than 12 meters may have commercial in the ground floor, and all plots on smaller streets may have no commercial.



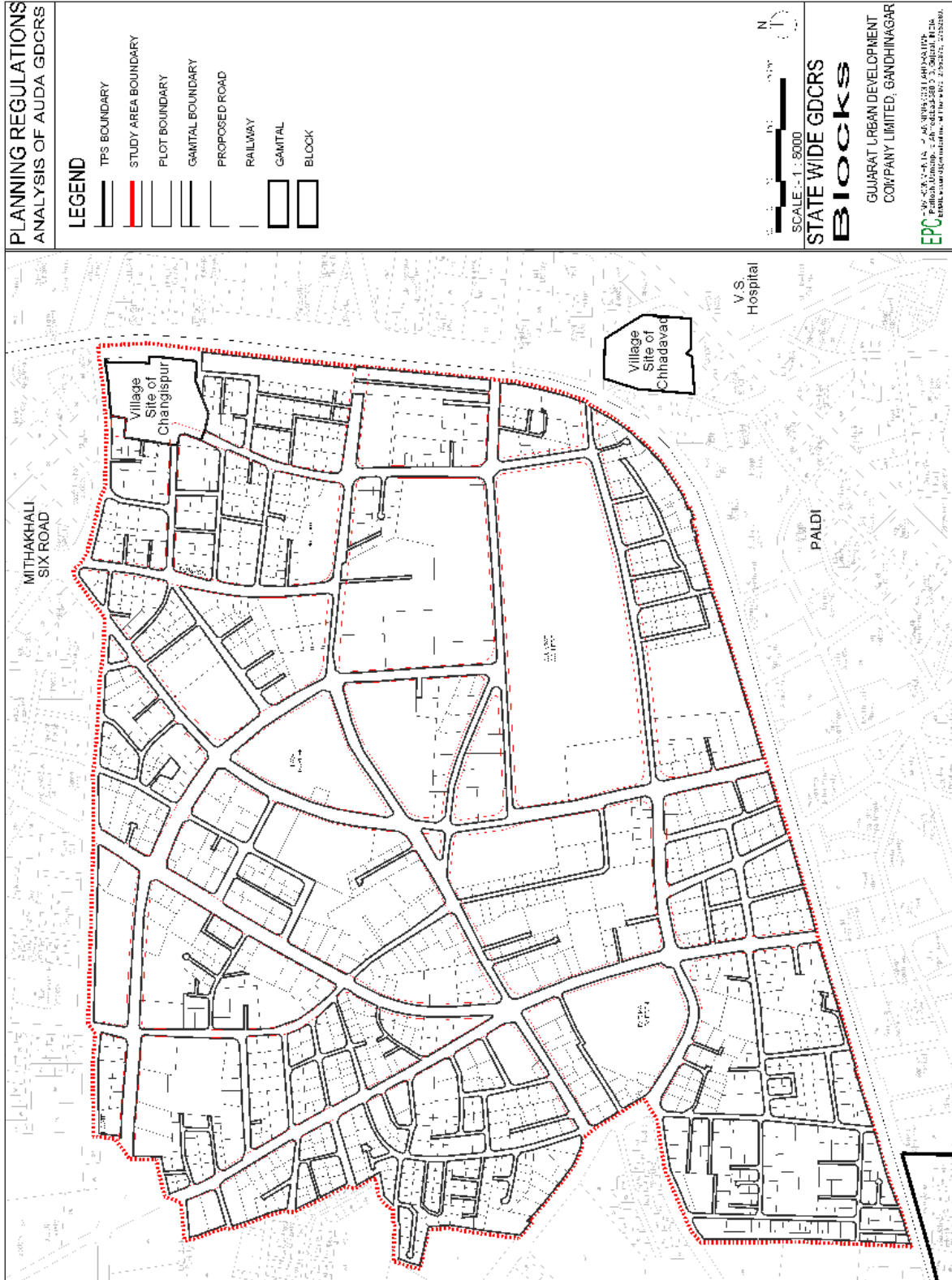
Map 3: Existing Land Uses Identified

However, when EPC staff visited the study area, they found the plots were really used in the following way.



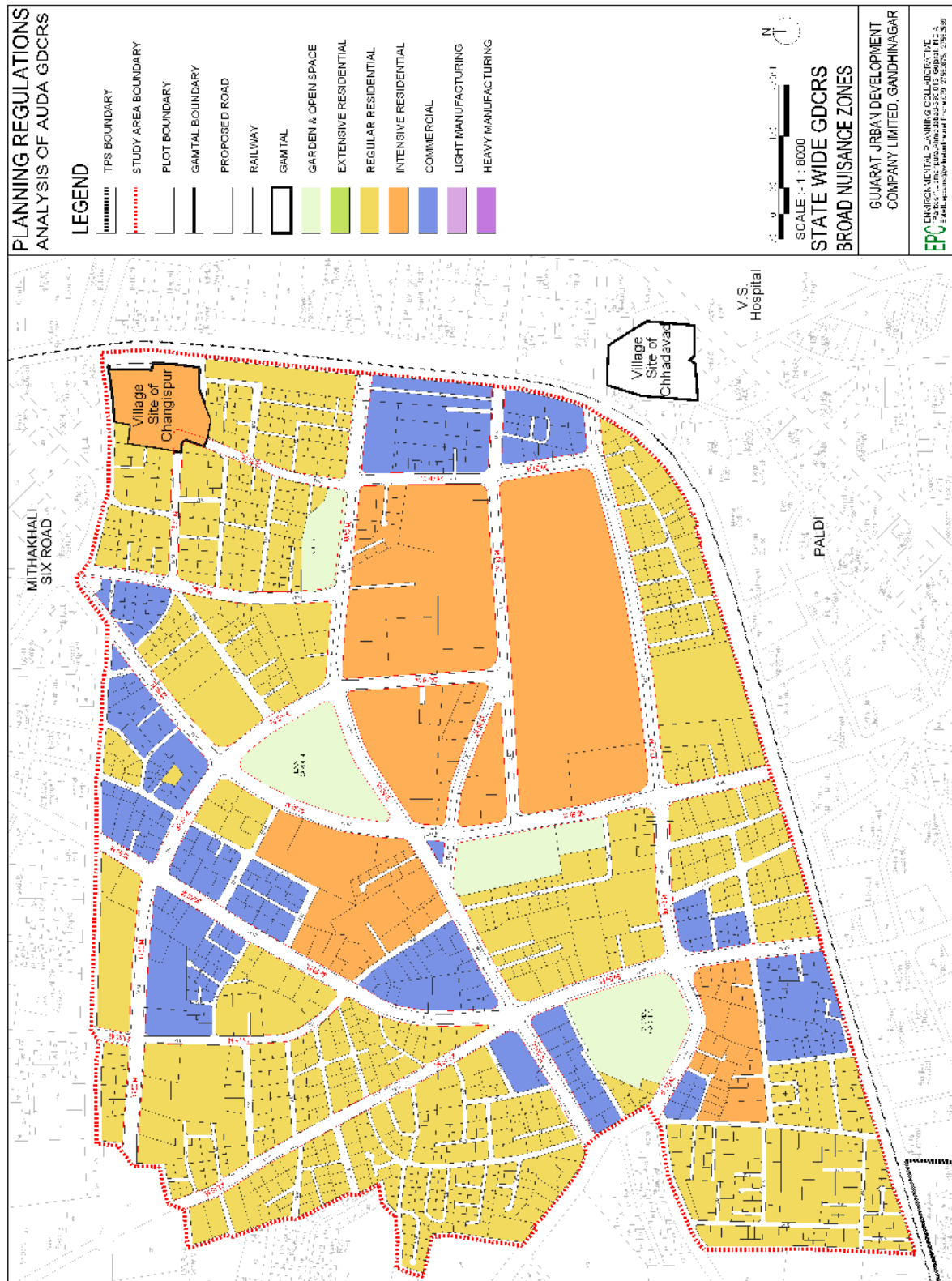
Map 4: Dividing the Study Area into “Blocks” for the Purpose of Zoning

For its advantages, we decided to use the block-based zoning methodology; see Appendix II. Then, as a first step on the way to applying the new set of zones suggested in the main body of this paper, we have demarcated “blocks” (in dark), usually defined by surrounding streets (or other barriers such as railways and water bodies).



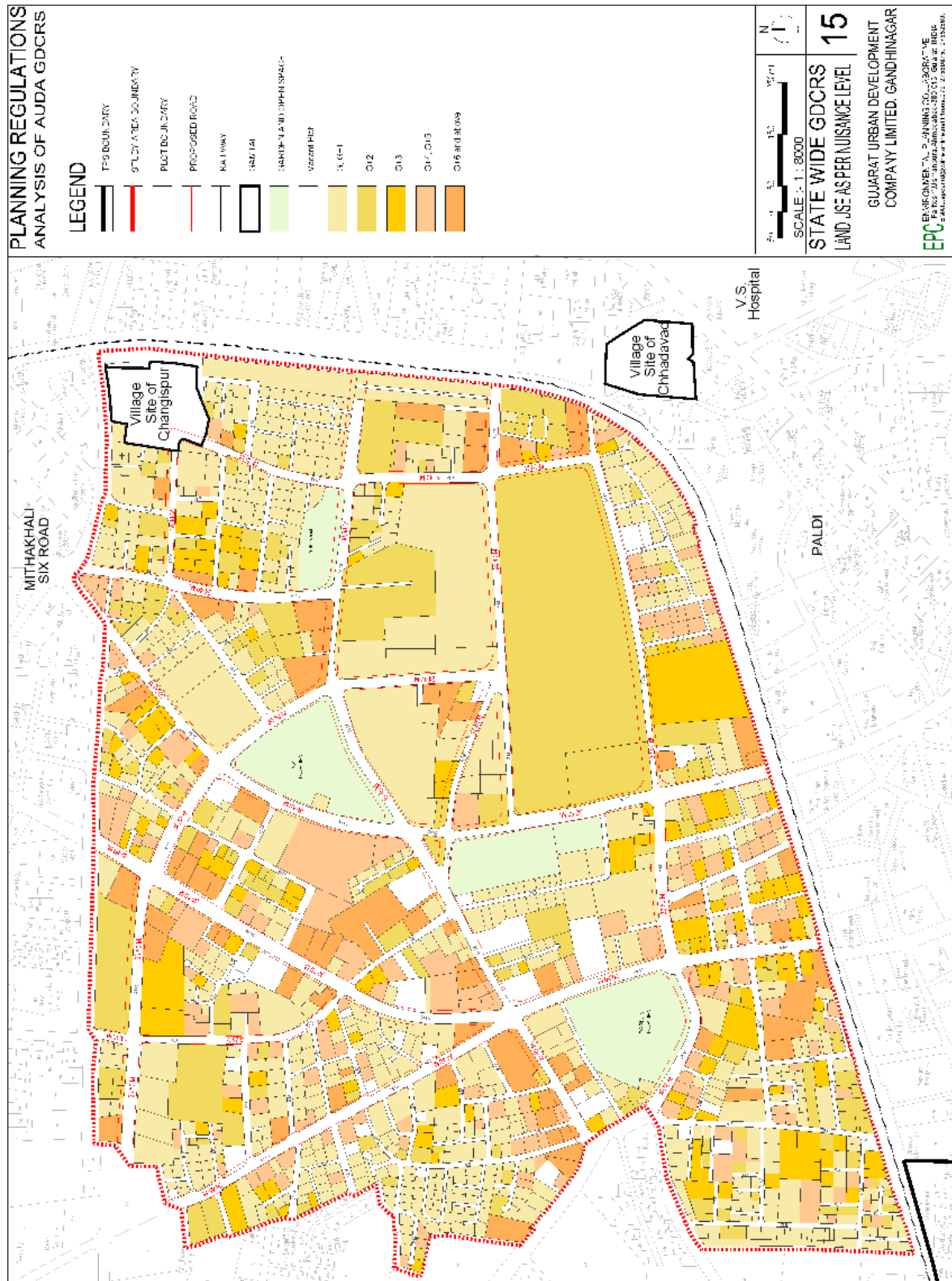
Map 5: Assigning “Preliminary Zones” to Each Block Within the Study Area

Then, based on the truly existing land uses, we have assigned the land-use zone (according to Table 2 from the main text) that best corresponds to the current status of the demarcated blocks.



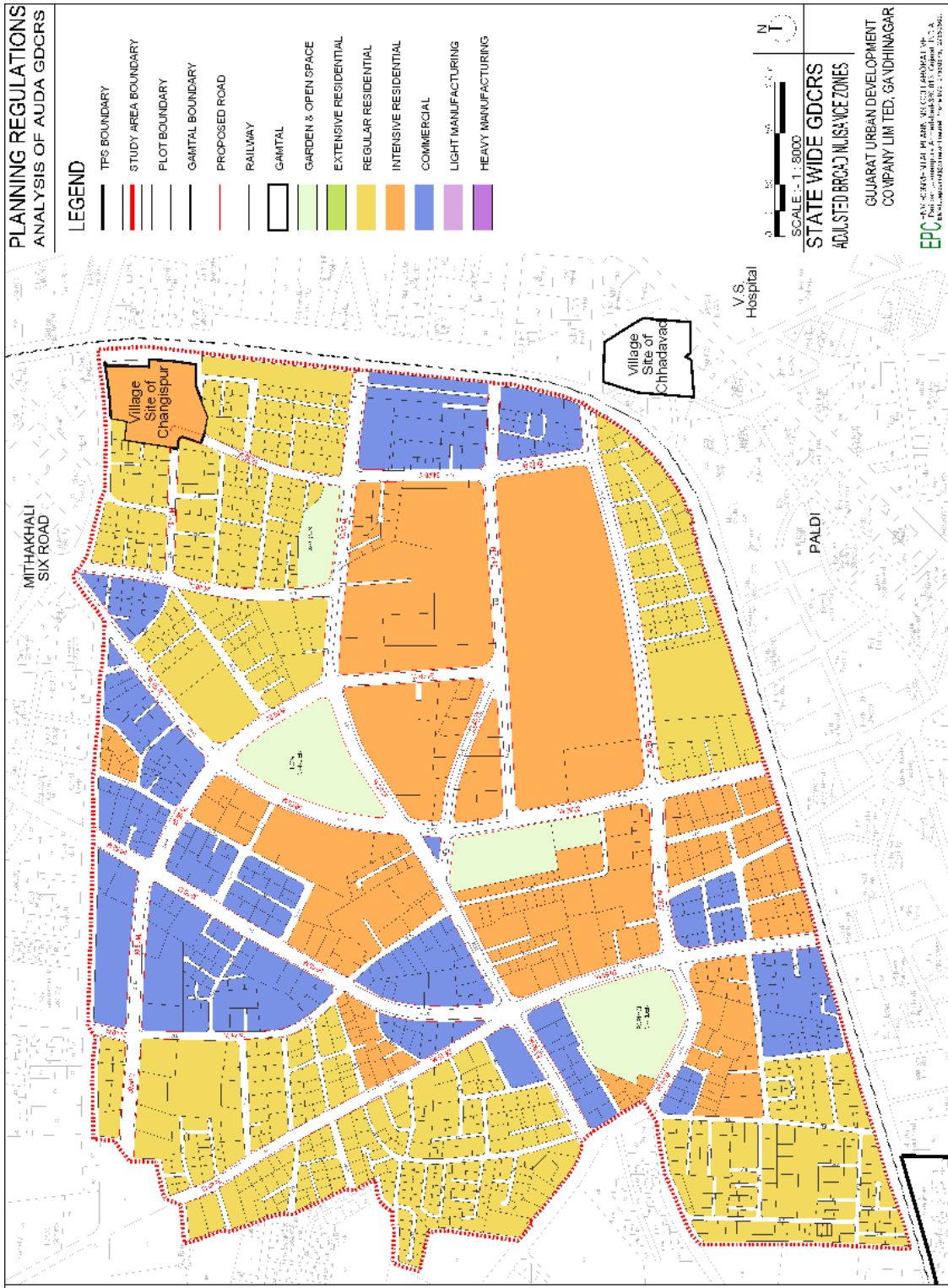
Map 6: Assessing Existing Height and Bulk on the Plots

In order to be able to fine-tune the zones, we have looked beyond existing land uses. For example, we assessed the development height (in number of floors; see legend) in the study area.



Map 7: Assigning “Final Zones” Based on Larger Planning Objectives

Based on other characteristics of the neighbourhood—such as the existing development height (see Map 6) and built-up densities, the location relative to landmarks and the overall development potential of the area—we have assigned the final zone to each block. (Note: while, for the purpose of our hypothetical case study, we did this “top-down,” in the real world there must be some mechanism for public participation.)



Map 8: Assigning Detailed Zones According to Street Width

Finally, we have shown how the intensity of development (height, density, etc) could be varied by street width: such an approach would, for example, promote higher densities for plots alongside larger roads and, thereby, bring more people closer to the transportation corridors. (The meaning of each zone can be seen on the table on the following page.) However, we are unsure if it is worthwhile to pursue this additional step; though the transport-oriented development may add value, the increasing complexity of the zoning approach may compromise the transparency of the whole system.

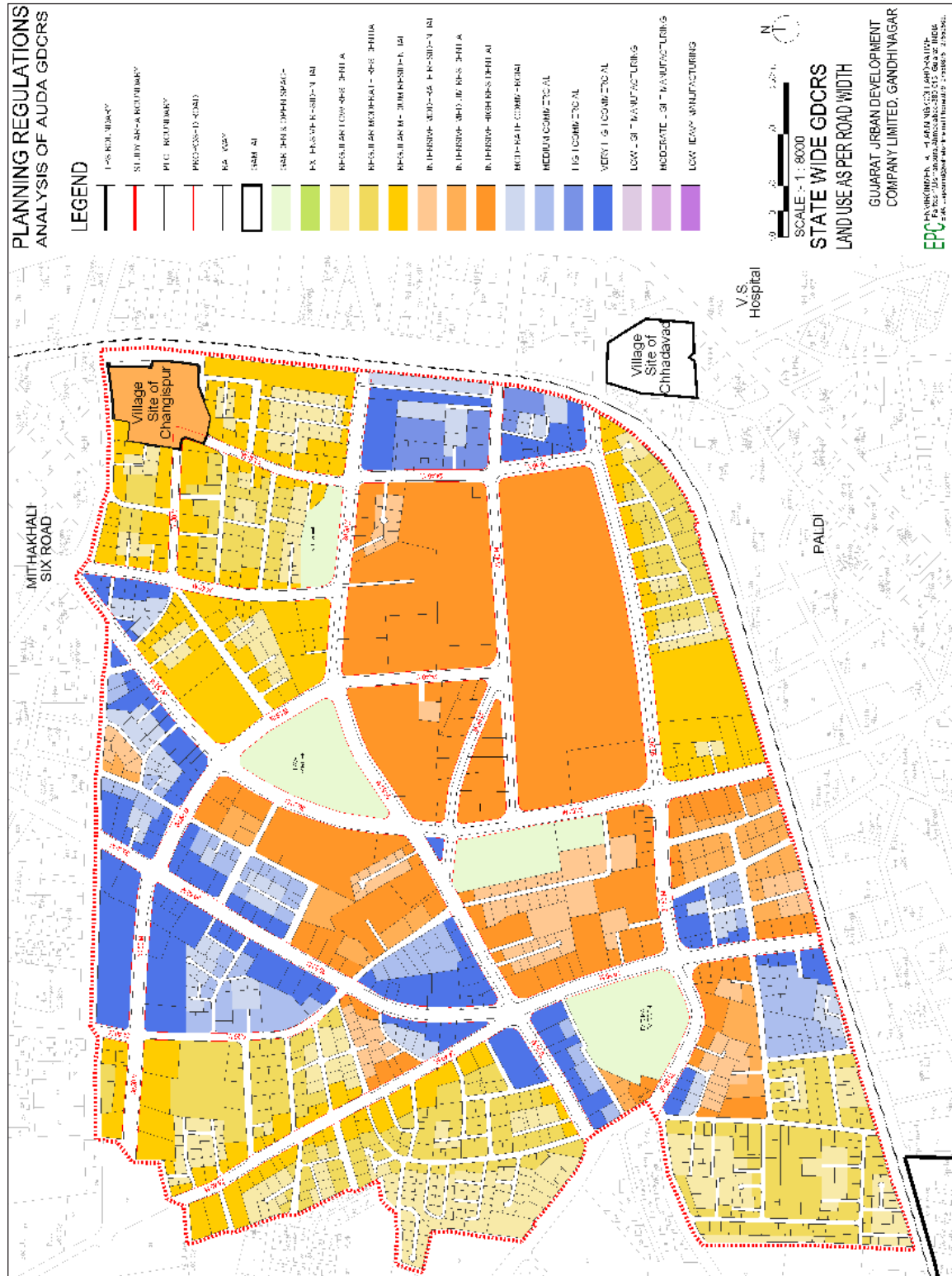


Table 3: Land-Use Zones by Nuisance Intensity and Street Width, Cross-Tabulated with Form and Land-Use Parameters

Land-Use Zone by Nuisance Intensity	Form-Based Zoning Parameters Varying by Street Width										Activities (Use and Scale of Use) by Benefit-adjusted Nuisance Intensity															
	Minimum Public Right of Way		Maximum Density (FSI)	Zoning Code	Minimum Road Setback		Minimum Side Margin		Maximum Development Height	Maximum Plot coverage	Decreasing ← Nuisance Intensity → Increasing															
	**6 m	18 m			3 m	3 m	3 m#	3 m#			7 m	0.2	Environmentally-Friendly Residential	(Small Scale) Home-based Commercial	Small-Scale Institutional	Regular Residential	(Small-Scale) Street-Linked Commercial	(Small-Scale) Home-Based Production	Medium-Scale Institutional	Intensive Residential	(Small-Scale) Street-Linked Production	Large-Scale Institutional	Large-scale Commercial	Light Manufacturing	Heavy Manufacturing	
Environmentally-Friendly Residential (Very low nuisance)	**6 m	18 m	Very Low (0.3)	E0	3 m	3 m	3 m#	7 m	0.2	✓	✓*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	**6 m	9 m	Low (1.2)	R1	3 m	3 m#	3 m#	10 m	–	✓	✓*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regular Residential (Low nuisance)	9 m	18 m	Moderate (1.8)	R2	–	3 m	3 m#	13 m	–	✓	✓*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	18 m	18 m	Medium (2.4)	R3	3 m	3 m	3 m#	20 m	–	✓	✓*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Intensive Residential (Moderate nuisance)	**6 m	9 m	Moderate (1.8)	I2	–	0 m	0 m	10 m	–	✓	✓*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	9 m	18 m	Medium (2.4)	I3	–	0 m	0 m	13 m	–	✓	✓*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	18 m	18 m	High (3.6)	I4	3 m	3 m	0 m	20 m	–	✓	✓*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Commercial (Medium nuisance)	6 m	9 m	Moderate (1.8)	C2	–	3 m#	3 m#	10 m	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	9 m	18 m	Medium (2.4)	C3	–	3 m#	3 m#	13 m	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	18 m	30 m	High (3.6)	C4	3 m	3 m	3 m#	20 m	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	30 m	30 m	Very High (6.0)	C5	3 m	3 m	3 m#	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Light Manufacturing (High nuisance)	9 m	18 m	Low (1.2)	L1	–	3 m	3 m#	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	18 m	18 m	Moderate (1.8)	L2	3 m	3 m	3 m#	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heavy Manufacturing (Very high nuisance)	18 m	18 m	Low (1.2)	H1	3 m	3 m	3 m#	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Beyond activities (land use and scale of use) we looked into other development parameters: e.g. larger streets are able to support better infrastructure and, thus, higher densities; small streets should not have road-side setbacks (because street widening would usually never be required) and houses may open directly on the street to promote socioeconomic interaction and safety; side margins should not be required, especially if both neighbours do not want them; development height should be somewhat harmonious but leave enough flexibility and plot coverage should not be regulated (except for in environmentally sensitive areas).

Notes: * This use should be allowed unless a critical mass of neighbours objects; see Appendix I.

** If existing streets are smaller than 6 meters, the use should still be permitted without road widening, # implies that side margins ought to be 3 meters, unless both neighbours agree on less. (Details for our decisions and an in-depth analysis can be found in the working paper.)

About WIEGO: Women in Informal Employment: Globalizing and Organizing is a global research-policy-action network that seeks to improve the status of the working poor, especially women, in the informal economy. WIEGO builds alliances with, and draws its membership from, three constituencies: membership-based organizations of informal workers, researchers and statisticians working on the informal economy, and professionals from development agencies interested in the informal economy. WIEGO pursues its objectives by helping to build and strengthen networks of informal worker organizations; undertaking policy analysis, statistical research and data analysis on the informal economy; providing policy advice and convening policy dialogues on the informal economy; and documenting and disseminating good practice in support of the informal workforce. For more information see www.wiego.org.

About Inclusive Cities: Launched in 2008, the Inclusive Cities project aims to strengthen membership-based organizations (MBOs) of the working poor in the areas of organizing, policy analysis and advocacy, in order to ensure that urban informal workers have the tools necessary to make themselves heard within urban planning processes. Inclusive Cities is a collaboration between MBOs of the working poor, international alliances of MBOs and those supporting the work of MBOs. The following partners are involved in the Inclusive Cities project: Asiye eTafuleni (South Africa), AVINA (Latin America), HomeNet South Asia, HomeNet South-East Asia, Kagad Kach Patra Kashtakari Panchayat (KKPKP, India), the Latin America Network of Waste Pickers, the Self-Employed Women's Association (SEWA, India), StreetNet International, and WIEGO. For more information see www.inclusivecities.org.

