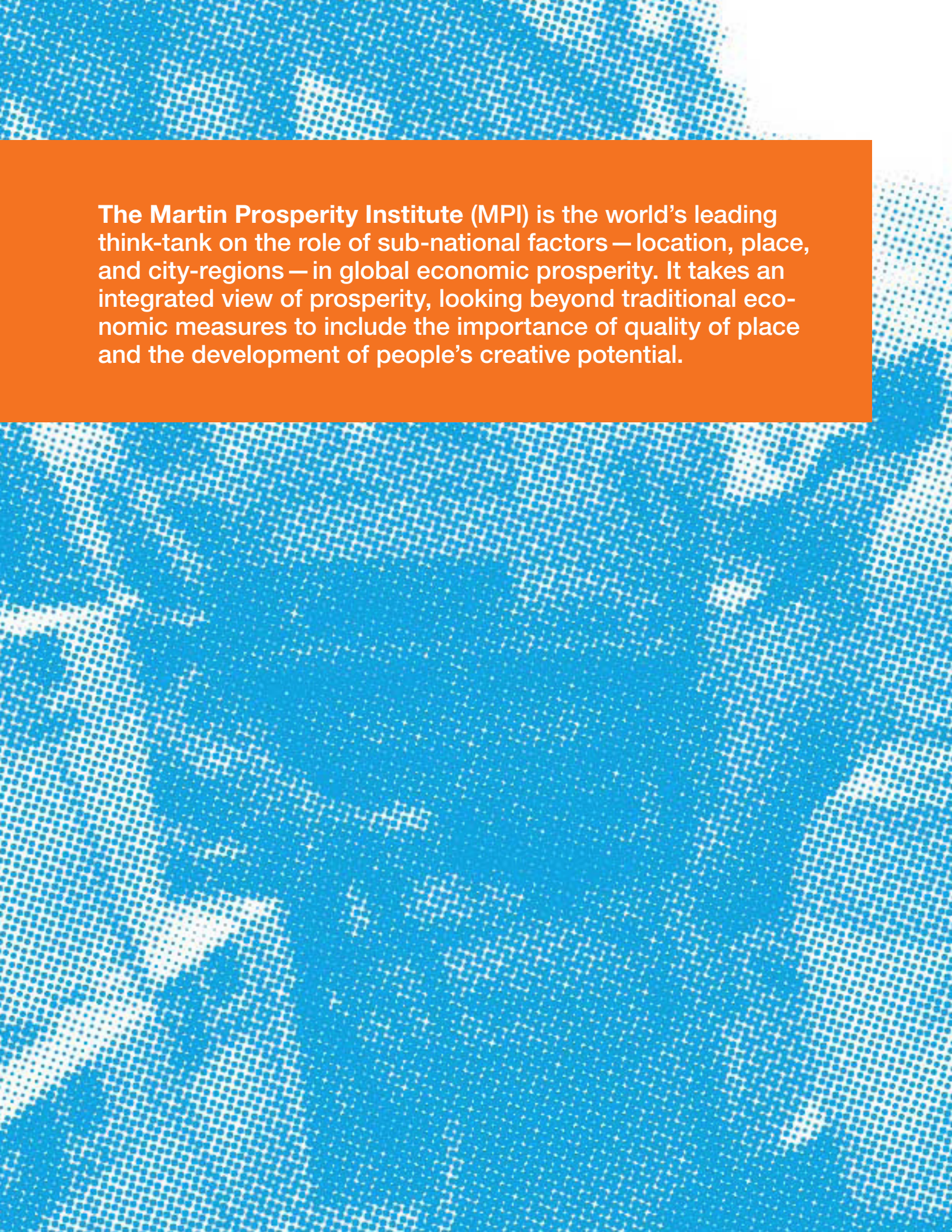# Understanding the Creative Economy in India's Cities

MARTIN
Prosperity *Institute*

The Martin Prosperity Institute (MPI) is the world's leading think-tank on the role of sub-national factors — location, place, and city-regions — in global economic prosperity. It takes an integrated view of prosperity, looking beyond traditional economic measures to include the importance of quality of place and the development of people's creative potential.

Understanding the Creative Economy in India's Cities

EXHIBITS

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Martin Prosperity Institute (MPI)
The Lloyd & Delphine Martin Prosperity Institute is the world's leading think-tank on the role of sub-national factors—location, place, and city-regions—in global economic prosperity. We take an integrated view of prosperity, looking beyond economic measures to include the importance of quality of place and the development of people's creative potential.

The Institute conducts relevant research to shape debate about economic prosperity and to inform private, public and civic decision-making at the highest levels. We are part of the Rotman School of Management at the University of Toronto on the St. George campus. We also serve as a special resource to the province of Ontario and the greater Toronto region.

The Institute for Competitiveness, the Indian knot in the global network of the Institute for Strategy and Competitiveness at Harvard Business School and the **Martin Prosperity Institute**, at the University of Toronto's Rotman School of Management have joined hands to establish The Prosperity Institute of India. The Institute has been set up with the objective of enhancing the prosperity and creativity of Asia by sharing knowledge in the 3Ts which are Technology, Tolerance, and Talent. Developed by the Martin Prosperity Institute, they are a useful analytical tool for understanding regional economic prosperity and growth by improving the traditional model emphasizing on companies, jobs, or technology. The primary activities of the Institute will be research and publications, training, advisory, and events which would further help in disseminating knowledge about creativity and prosperity among the genres.

**Kevin Stolarick,
Research Director of MPI**
Dubbed the "Official Statistician of the Creative Class", Kevin Stolarick, PhD, combines a depth of knowledge with an appreciation of the importance of finding and sharing the knowledge or "pearls of wisdom" gained from his comprehensive understanding of the Creative Class and the Creative Economy. He is the Research Director at The Martin Prosperity Institute at the Rotman School of Management, University of Toronto and the Inaugural Walton Distinguished Visiting Fellow in Sustainability at the School of Sustainability, Arizona State University. He has held faculty positions at the College of Humanities and Social Sciences and the H. John Heinz III School of Public Policy and Management, Carnegie Mellon University, Pittsburgh, Pennsylvania, USA and for over a decade worked with technology in the insurance industry as a manager of strategic projects. He holds a PhD in Business Administration and an MBA from the Tepper School of Management, Carnegie Mellon University and a BS in Honors in Applied Computer Science from Illinois State University. He has taught numerous courses in Statistical Analysis, Information Systems and Regional Economic Development. His research interests include the relationship between firm performance and information technology and the impacts of technology, tolerance, talent, and quality of place on regional growth

and prosperity. Kevin provided quantitative research and analytical support for several of Richard Florida's books including *The Rise of the Creative Class* and *Rise Revisited (the 10th Anniversary Edition)*. He continues in collaboration with Richard and others researchers. This research includes primary development of measures, indicators, and benchmarking approaches with significant impact on the growth and development of the Creative Class and Creative Economy theory. Kevin is one of the few statistical analysts who has the complete works of Edward Tufte and Donald Norman on his shelves.

Amit Kapoor, Honorary Chairman, Institute for Competitiveness, India
Dr. Amit Kapoor is Honorary Chairman at Institute for Competitiveness, India and Prosperity Institute of India in addition to chairing the India Competitiveness Council. He sits on the board of Competitiveness initiatives in Mexico, Netherlands and France in addition to being advisor to Thinkers50 and participant with the Global Solutions Network of Martin Prosperity Institute and Rotman School of Management. He is an affiliate faculty for the Microeconomics of Competitiveness and Value Based Health Care Delivery courses of Institute of Strategy and Competitiveness, Harvard Business School. He has been inducted into the Competitiveness Hall of Fame at Harvard Business School, which is administered by Institute for Strategy and Competitiveness at Harvard Business School. Amit is a Ph.D. in Industrial Economics and Business Strategy and has received the Ruth Greene Memorial Award winner for writing the best case of the year, by North American Case Research Association (NACRA). He has been invited by Kennedy School of Government and Harvard Law School, Harvard University; Pennsylvania State University to address the Vice Chancellors & Academic Leaders training programs; World Economic Forum at its India Economic Summit and Asia Summit to present his views on various issues and themes like strategy, outsourcing and economic development (Complete list of speaking engagements). Amit is the author of India City Competitiveness Report, India State Competitiveness Report, India State Sustainability Report, Livability Report et al. He is also a columnist with Mint, Financial Express, Outlook Business and Governance

Now in addition to penning down academic pieces (Complete set of articles & publications). Based on his work two awards have been constituted within the country titled "State Competitiveness Awards" by Mint & Hindustan Times wherein the Chief Ministers are awarded and "Institute for Competitiveness Mint Strategy Awards" wherein the corporates are awarded for their strategic acumen. He chairs the jury and curates Porter Prize and Tapscott Award in addition to curating events like Competitiveness Forum, Thinkers 50 (India) etc. He tweets @arthsastra and maintains a professional profile at LinkedIn.

Melanie Fasche, Post-Doctoral Fellow, Martin Prosperity Insitute
Melanie Fasche is a post-doctoral fellow at The Martin Prosperity Institute in the Joseph L. Rotman School of Management at the University of Toronto. Her research focuses on *value making*, *intermediation and curation*, *start-ups and entrepreneurial careers*, and *city building* in the creative economy. Melanie's doctoral thesis *Making value: contemporary visual art, careers and place* developed a conceptual framework of the valuation process of contemporary visual art. It reveals how creativity and talent are valued and rewarded over space and time.

Previously Melanie was based in Berlin and affiliated as external PhD candidate in Urban and Regional Economic Studies at HafenCity University Hamburg. She had worked as freelance consultant in public policy projects with a focus on the creative industries and arts in Berlin and was Visiting Lecturer in Urban Studies at Free University Berlin. She had held fellowships at Columbia University, Technical University Berlin, Institute of Regional and Structural Planning (IRS) in Erkner/Berlin, and the University of New South Wales in Sydney. Melanie's diplom thesis *Glocalization, gentrification and creative business services: a case study of Newtown, Sydney* was honored with the Young Researchers Award by the German-speaking Association for Australian Studies (Gesellschaft für Australienstudien e.V.).

EXECUTIVE SUMMARY

This report sheds light on competitiveness and prosperity of India's 50 most competitive cities. The analysis pursues a creative economy perspective against the backdrop of India's urbanization and economic transitioning from an agricultural and industrial economy to a creativity- and service-based post-industrial economy. The analysis applies the innovative framework of Creative Capital theory and explores the presence of the so-called 3Ts, referred to as Tolerance, Talent and Technology, in each of the 50 cities and compares them to each other. The results of the 3T analysis are then combined to build the overall Creativity Index of the 50 cities.

The analysis of Tolerance includes three proxy measures due to a lack of census data on visible minorities and LGBT at the urban level. The proxy measures consist of a Religious Diversity Index, population density, and female to male literacy ratio which are combined to build the Tolerance Index of the 50 cities. The six major Tier-I cities of Bengaluru, Chennai, Delhi, Hyderabad, Mumbai and Kolkata, along with the Tier-II cities of Thiruvananthapuram and Kozhikode in Kerala, Guwahati in Assam, and Chandigarh make up the Top 10 Indian cities on the Tolerance Index, followed by Kochi in Kerala ranking 11th.

The analysis of Talent includes five measures, Creative Class share, and a proxy of four measures making up for the lack of census data on the share of population over the age of 25 with a bachelor degree of higher at the urban level. The proxy for degree share consists of pupil to teacher ratio higher than 35 at Upper Primary Level, male literacy rate, female literacy rate, and the number of engineering and MBA schools. In combination these measures build the Talent Index of the 50 cities. Kochi in Kerala leads the Talent Index followed by Mumbai and Thiruvananthapuram in Kerala. The other major cities with the exception of Hyderabad, Pune in Maharashtra, Kozhikode in Kerala and Chandigarh make up the top 10 of the 50 cities.

The analysis of Technology includes only two measures, Tech Connectivity and Tech Access, due to a lack of census data on Tech Education at the urban level. Tech Connectivity is measured by the number of wireless broadband connections per 100,000 and the increase in the number of wireless subscribers per 100,000, and Tech Access is measured by the share of households using a computer or laptop to use the internet and the share of households with mobile phones. Taken together these measures build the Tech Index. The six major cities, as well as Pune in Maharashtra, Ahmedabad and Surat in Gujarat, and Jaipur in Rajasthan, rank in the top 10 of the 50 cities.

The overall Creativity Index, which combines the individual 3Ts, Tolerance, Talent and Technology, and the regional patterns that emerge within each of the individual T analysis. The top 10 of the Creativity Index is lead by India's six major cities followed by Thiruvananthapuram in Kerala (7th), Pune in Maharashtra (8th), Kochi in Kerala (9th) and Ludhiana in Punjab (10th).

The 3Ts analysis reveals two prevailing and interrelated correlations, first, between scale and performance expressed by major cities ranking predominately very high, and second, between the quality of place and performance expressed by the cities in Kerala known for progressive education policies. These results confirm the general assumptions underlying Creative Capital theory, that, first, urbanization refers to larger and economically more prosperous populations, emphasized as economies of scale and agglomeration effects, and that second, competitiveness, economic growth and prosperity depend more so on productivity, technology and human capital or skill, emphasized by the quality of place.

Thus, both scale and quality of place are closely intertwined. Although India has only been urbanizing slowly with still two-third of its total population living in rural areas it is expected that 50 percent of India's total population or 850 million Indian people may live in cities by 2050 — an enormous potential for competitiveness and prosperity. However, in order to unleash this potential the major challenge will be to balance expansion, access to opportunities or equity, and quality.
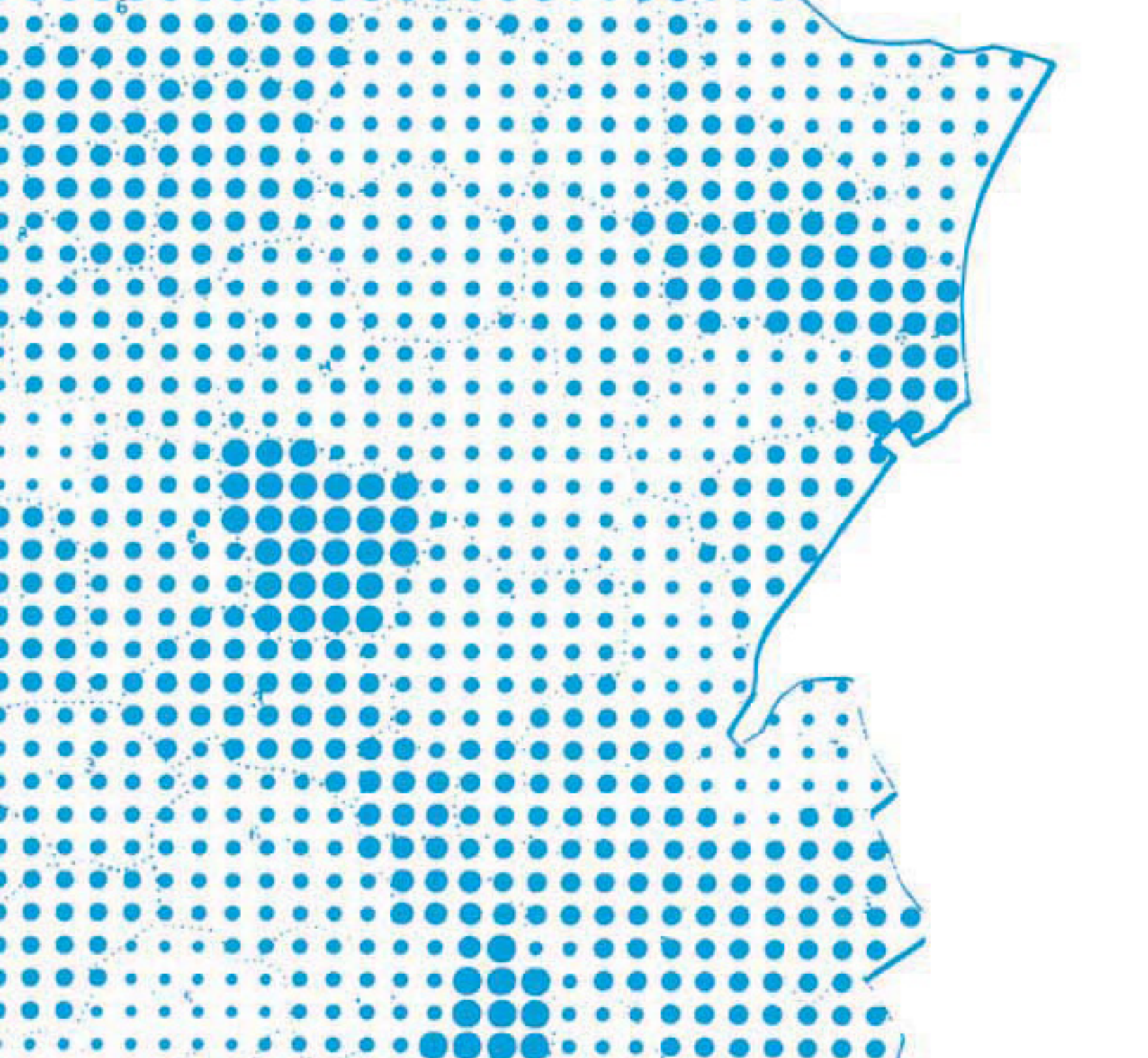
Understanding the Creative Economy in India's Cities

1 INTRODUCTION

Humanity passed a milestone in 2007 when for the first time in human history more people were living in urban than in rural areas. Since then urbanization has been expanding and gaining ground. It is projected that 60 percent of the global population will live in urban areas in 2030 eventually extending to 70 percent by 2050. Today, the urban population generates more than 80 percent of the global GDP (McKinsey Global Institute, 2011). Agglomeration forces and economics of scale make cities more productive and drive economic growth and prosperity—albeit not unconditionally or necessarily for everyone. The realization of growth and prosperity for cities critically depends on acknowledging potentials, and anticipating and cleverly managing looming challenges. Hence, the economic role of large cities varies widely across the globe. Today, the economically most powerful cities are still located in the West (Florida, 2012).

Future urban expansion will predominately take place in Asia and Africa where current urbanization levels of around 40 percent are relatively low in comparison to developed countries such as the United States with an urbanization level of over 90 percent. It is expected that the center of gravity of the global urban population will move South and East reviving a global prominence that Asia had enjoyed before the Industrial Revolution in the West. Emerging countries, such as the BRICS countries, already play a role in shaping today's global economic relations, expressed by their inclusion and recognition in G20 meetings, the World Economic Forum and other economic development proceedings. The rise of the urban economies in the BRICS countries presents an opportunity to strengthen the countries' competitiveness globally and reshape current global hierarchies and political-economic relationships.

Yet India has only been slowly urbanizing since two-thirds of the Indian population are still living in rural areas. However, it is expected that India will surpass China in population size and that India will double its urban population over the next two decades with a majority of its population living in cities by 2050. It is estimated that by 2030 India's cities could create 70 percent of all new jobs and produce more than 70 percent of the national GDP which would amount for an almost fourfold increase in national per capita income from today (McKinsey Global Institute, 2010). Moreover, India's urbanization and its prospects of growth and prosperity are observed with heightened interest beyond India's borders as international entrepreneurs and businesses, and footloose capital are evaluating growth opportunities and emerging markets. However, recent declines in the Rupee relative to the US dollar and other international currencies suggest that the shine might be wearing off an overly optimistic assessment.

In an increasingly urban economic environment, sustainable economic gains are realized by nurturing, attracting and retaining a talented, creative and knowledgeable workforce rather than by staying focused on conventional industries. A focus on building a talented, creative and knowledgeable workforce is a promising goal because it helps to foster competitive advantage by driving innovation, new startups, and encouraging broader improvements in overall productivity and prosperity (Florida, 2002; Florida, Mellander and Stolarick, 2008; Martin Prosperity Institute, 2009a). Put differently, wherever talent grows or goes, creativity, innovation, and economic growth are sure to follow (Florida, 2005). Investing in people during times of transformation in addition to investments in businesses and places provides a proactive and flexible approach to economic restructuring that allows labor markets to adapt, while new businesses and industries emerge and places become more attractive. Leading post-industrial nations, such as the United States, Canada, Sweden, Japan, Finland, Germany and the United Kingdom (Florida, 2005) are now competing based on creativity- and knowledge-based factors such as technology, innovation and talent attraction.

Establishing an approach to economic development that centres on creativity will help India's cities to transform and grow their urban economies and generate future prosperity. In recognizing the importance of courting Talent, building Technology, and promoting Tolerance economic competitiveness is increased. Taken together, the metrics of Talent, Technology, and Tolerance are referred to as the 3Ts of economic development (Florida, 2002). For India's cities a 3T approach would mean enhancing the talent of its residents in order to develop the businesses and industries of tomorrow; investing in the infrastructure required to mobilize more innovation and economic growth; and recognizing the importance of openness and diversity in growing economic advantage.

The Martin Prosperity Institute (MPI) and the Prosperity Institute of India (PII) have conducted an analysis of the creative economy assets of the 50 most competitive Indian cities (Institute for Competitiveness, 2013). The analysis explores the presence of Talent, Technology and Tolerance in these 50 cities and compares them to each other. The assessment will help to measure the capacity of Indian cities to foster

India's 50 most competitive cities within the urban classification per State/Union Territory

Exhibit 1

Name of State/Union Territory	X	Y	Z
Andhra Pradesh	Hyderabad (UA)	Vijayawada (UA) Visakhapatnam (UA)	—
Assam	—	Guwahati (UA)	—
Bihar	—	Patna (UA)	—
Chandigarh	—	Chandigarh	—
Chhattisgarh	—	Raipur (UA)	—
Delhi	Delhi (UA)	—	—
Gujarat	—	Ahmedabad (UA) Surat (UA) Rajkot (UA) Vadodara (UA)	—
Haryana	Faridabad Gurgaon (UA)	—	—
Himachal Pradesh	—	—	Shimla
Jammu & Kashmir	—	Srinagar (UA) Jammu (UA)	—
Jharkhand	—	Jamshedpur (UA) Dhanbad (UA) Ranchi (UA)	—
Karnataka	Bangalore (UA)	Mysore (UA)	—
Kerala	—	Kochi (UA) Kozhikode (UA) Thiruvananthapuram (UA)	—
Madhya Pradesh	—	Jabalpur (UA) Bhopal (UA) Indore (UA)	—
Maharashtra	Greater Mumbai (UA)	Nashik (UA) Nagpur (UA) Pune (UA)	—
Orissa	—	Bhubaneshwar (UA)	—
Puducherry	—	Puducherry (UA)	—
Punjab	—	Amritsar (UA) Ludhiana	—
Rajasthan	—	Jaipur	—
Tamil Nadu	Chennai (UA)	Coimbatore (UA) Madurai (UA)	—
Uttaranchal	—	Dehradun (UA)	—
Uttar Pradesh	Noida (UA)	Lucknow (UA) Kanpur (UA) Meerut (UA) Agra (UA) Allahabad (UA) Varanasi (UA)	—
West Bengal	Kolkata (UA)	Asansol (UA)	—

creativity-based economic development strategies. This report follows up on an earlier report that focused on the creative economy of India's States and Union Territories (Martin Prosperity Institute, 2013). Taken together both reports are intended to facilitate the discussion about competitiveness and prosperity in light of potentials and constraints in India's urbanization and transitioning from an agricultural and industrial economy to a creativity- and service-based post-industrial economy during the 21st century.

2 SCOPE

Creative Capital theory and the 3Ts of economic development, which refer to talent, technology and tolerance, provide an innovative framework for measuring a city's Creative Economy potential. In this report, the core characteristics of the 3Ts are reworked to apply to the Indian context because of a lack of certain statistical data at the urban level. The report focuses on the 50 most competitive Indian cities determined by the most recent India City Competitiveness Report (Institute for Competitiveness, 2013). These 50 cities (**Exhibit 1**) are categorized by the standard urban classification implemented by the Sixth Pay Commission following the basis of Compensatory City Allowance (CCA) and referring to variables such as cost of living, real estate prices and other regional factors. The urban classification is divided into three groups: Class X cities, Class Y cities, and Class Z cities, which are more commonly known as Tier-I, Tier-II, and Tier-III cities. The 50 Indian cities as per above stated classification are listed in **Exhibit 1** and mapped in **Exhibit 2**.

India's 50 most competitive cities | Exhibit 2
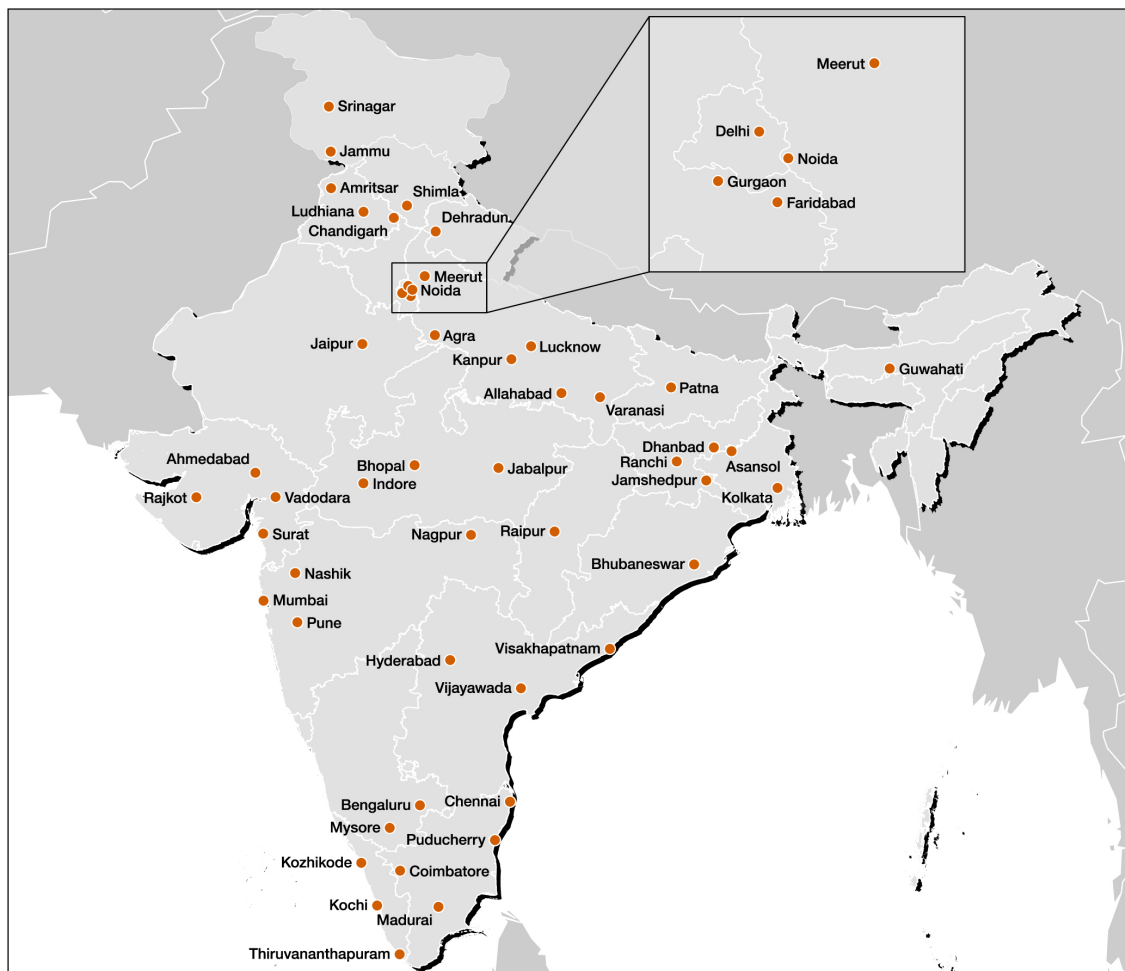
3 BRIEF REVIEW OF INDIA'S URBANIZATION AND ECONOMIC DEVELOPMENT

Urbanization in India dates back to the Indus civilization (3,000–1,500 BC). People have been gravitating towards urban agglomerations ever since, hoping to realizing economic, social, and cultural opportunities. India's cities have developed distinct characteristics depending on their respective key urbanizing element, whether they developed into major administrative areas, trade- and market places, centres of education or religious destinations. This heritage can be seen in today's cities. However, changing power regimes and colonialism undermined and jeopardized considerate urban planning and prosperity potentials. Accelerating population growth and increasing urbanization associated with a transition from an agricultural economy to an industrial and post-industrial economy have fostered economic growth and prosperity while also being accompanied by a widening gap between rich and poor, environmental issues, expropriation and tensions between traditions and new ideas.

Since India's independence in 1947 its urban population has been growing consistently at higher rates than its rural population (United Nations, 2011). In 1950, 63.5 million people lived in urban agglomerations accounting for 17 percent of India's total population. By 1990 India's urban population had more than tripled to 223 million people or 25.5 percent of the total population. Still, two thirds of the total population lived in rural areas.

The extent and true scope of India's urbanization since the early 1990s can be best analyzed and appreciated by its visualization through an orbital or aerial view (Stolarick, 2013a). Since 1992, the Operational Linescan System (OLS) of the US Defense Meteorological Satellite Program (DMSP) has been collecting images of the world at night. These images capture the nighttime lights generated on the ground. **Exhibit 3** shows the nighttime lights for India and surrounding countries from 1992 in comparison to 2010.

While the bright spots of Delhi, Kolkata, the Mumbai-Pune region and the Hyderabad, Bangalore, Chennai triangle are all clearly visible in 1992, they have all increased in intensity and size by 2010. In addition, a whole series of new constellations have been added to the Indian subcontinent. While the urbanization of India is something that is happening in the largest cities, it is also something that is happening across the country, it is a process of growth and intensification of existing settled locations and not the formation of new settlements, except around the edges of existing ones. Growth is not restricted to just the largest cities. Smaller cities, some in areas immediately adjacent to metros, some neighboring but not yet part of a larger metro, some in more remote locations, have also seen significant increases in their urbanization over the same period. It's not just those few bright spots getting bigger and brighter — it's also a whole new collection of cities and towns increasing their visibility at night which not only means increased electrification but also larger and more economically prosperous populations.

In 1990, the population of the urban agglomeration of Delhi accounted for a total of 9.7 million people which grew to 15.7 million in 2000 and 22.2 million in 2010 expressed by growth rates of 4.8 percent and 3.4 percent respectively (UN-Habitat, 2013). **Exhibit 4** shows the nighttime lights for the Delhi region by comparing the years of 1992, 2000, and 2010.

Not only has the urbanized area surrounding Delhi increased significantly over this period,

India at night 1992 and 2010   Exhibit 3
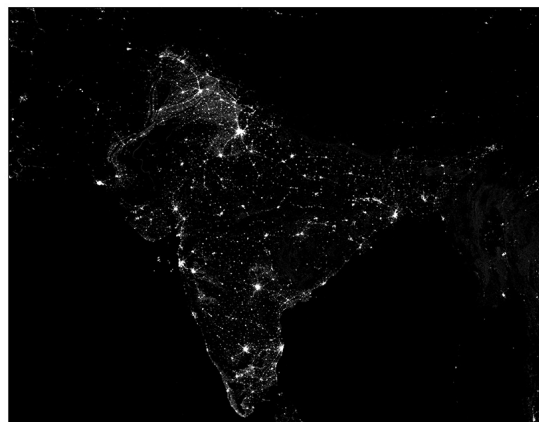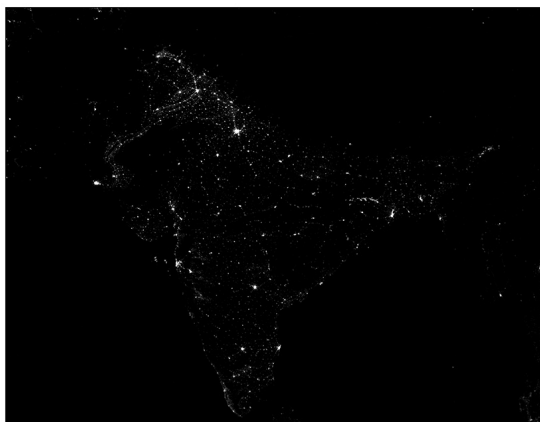
but the lower intensity lights in the area surrounding the most intense nighttime lights have also increased significantly. Delhi, like almost all metropolitan areas, expands along road access routes until it reaches other cities that effectively become part of the larger metro (**Exhibit 5**).

In 1992, Faridabad in the southeast was still slightly separated from the core of Delhi. By 2010, the growth of Noida is seen and Faridabad is strongly connected to the rest of the metro. In 1992, Meerut northeast of the core is separate as is the small blip of Modinagar on the Meerut road from Ghaziabad. By 2010, Ghaziabad is indistinguishable from the rest of Delhi; Meerut has grown considerably; Modinagar has stretched out more along the road; and the core urbanized portion of Delhi continues to grow. All around the Delhi region, the maps show the growth of not only the core of Delhi but also surrounding cities and towns. Some like Bahadurgarh west of the core or Sonipat/Sector 15 to the north become part of the core while others like Aligarh in the southwest show significantly increased urbanization without becoming part of the Delhi metro. And the growth of the urban agglomeration of Delhi will continue; it is projected that 28.6 million people will live within the urban agglomeration of Delhi by 2025 (UN-Habitat, 2013).

In 1990, the total populations of the urban agglomerations of Mumbai and Pune were 12.3 million and 2.4 million respectively. By 2000 the population of the urban agglomeration of Mumbai had increased to 16 million accounting for a growth rate of 2.7 percent and by 2010 it had reached the 20 million mark accounting for a growth rate of 2.2 percent. Over the same period the urban agglomeration of Pune had grown to 3.7 million in 2000 and 5 million in 2010, accounting for growth rates of 4.1 percent and 3.1 percent respectively, or doubling its population size within 20 years.
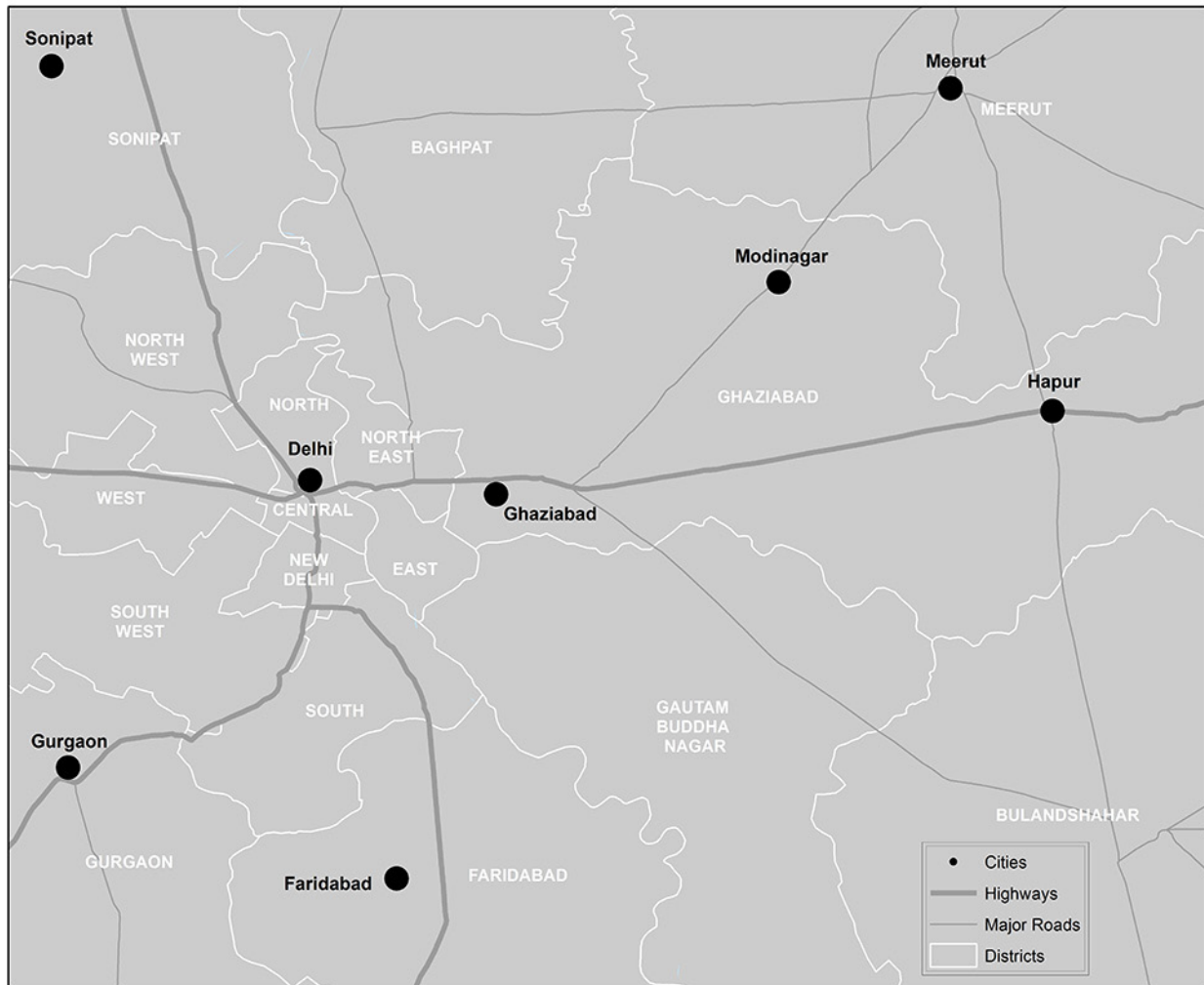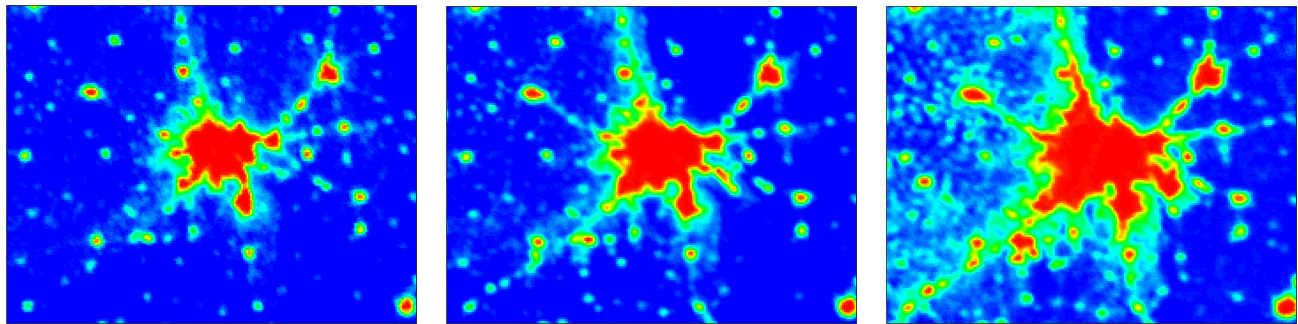
Exhibit 6 shows the nighttime lights for the Mumbai and Pune region by comparing the years of 1992, 2000, and 2010.As both water and land can be dark at night, the coast is not shown. And, light reflected off the water, or "overglow", is shown so Front Bay and Thane Creek do show nighttime light. The significant amount of growth and urbanization that has happened in the Mumbai metropolitan region is already well-documented but strikingly shown here. While the maps show slight increases for Mumbai across the entire period, a large amount of growth has been in the past few years. What hasn't been as well-documented or discussed is the tremendous growth of the Pune region. The tripling of area of saturated nighttime light for Pune is significant, and the region around Pune has also seen significantly increased urbanization. Urbanization has also increased along the Rasayani-Lonavala-Vadgaon corridor between Mumbai and Pune (**Exhibit 7**).

Limited by its coastline, Mumbai has grown north along the coast, to the east, and towards a growing Pune. Vasai Creek to the north of the core has not been a restrictive boundary as Nala Sopara and Vasai have grown considerably as have Uran and Nehru Port across Front Bay to the south. Increased urbanization pressures are leading to the expansion of places that had previously been considered inaccessible. It is projected that the populations of the urban agglomerations of Mumbai and Pune will grow to 25.8 million and 6.7 million by 2025 (UN-Habitat, 2013).

However, in comparison to Western countries like the U.S. and Canada and also its BRICS countries' peers India is less urbanized—despite varying definitions of what constitutes an "urban" area (see appendix for varying defintions). In 2010, Brazil's urban population accounted for a share of 84.3 percent of the country's total population projected to rise to 87.7 percent in 2025 showing an urbanization rate similar to developed countries (United Nations, 2011). Russia's, China's and South Africa's urban populations accounted for 73.7, 49.2 and 61.5 percent of the respective countries' total populations in 2010 and are projected to reach levels of 76.5, 65.4 and 67.9 percent respectively in 2025. India, in contrast, revealed an urbanization rate of only 30.9 percent in 2010 and is projected to reach a rate of 37.2 percent by 2025, which would still be well below the urbanization rates of its BRICS countries' peers (United Nations, 2011).

Yet, soon India will overtake China as the most populous country in the world. Moreover, India's population center is gradually moving towards urban agglomerations. It is projected that the majority of the Indian population could live in urban agglomerations by mid-21st century. It took nearly 40 years, from 1971 to 2008, for India's urban population to rise by nearly 230 million and it may take only half that time to add the next 250 million (McKinsey Global Institute, 2010). Thus, despite India's low overall urbanization rate the absolute number of people living in urban agglomerations will be enormous and unparalleled anywhere else in the world except for China. It is estimated that by 2030 India could have 68 cities with a population size of more than 1 million, 13 cities with a population size of more than 4 million, and 6 megacities with a population size of 10 million and more, of which at least two, Delhi and Mumbai, will be among the five largest cities in the world (ibid.). **Exhibit 8** shows the projections by UN-Habitat

Delhi nighttime lights 1992, 2000, and 2010[1]

Exhibit 4

Larger Delhi metropolitan region

Exhibit 5

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[1] Here, instead of just back and white a color spectrum is used to show the intensity of the night light. The blue areas are places where no nighttime light was collected, but everywhere else shows where there are fairly significant sources of light at night. As the spectrum runs from blue to cyan to green to yellow to orange to red, the amount of visible light detected by the satellite increases from total darkness to total saturation.

Mumbai-Pune nighttime lights 1992, 2000, and 2010

Exhibit 6

Larger Mumbai-Pune metropolitan region

Exhibit 7
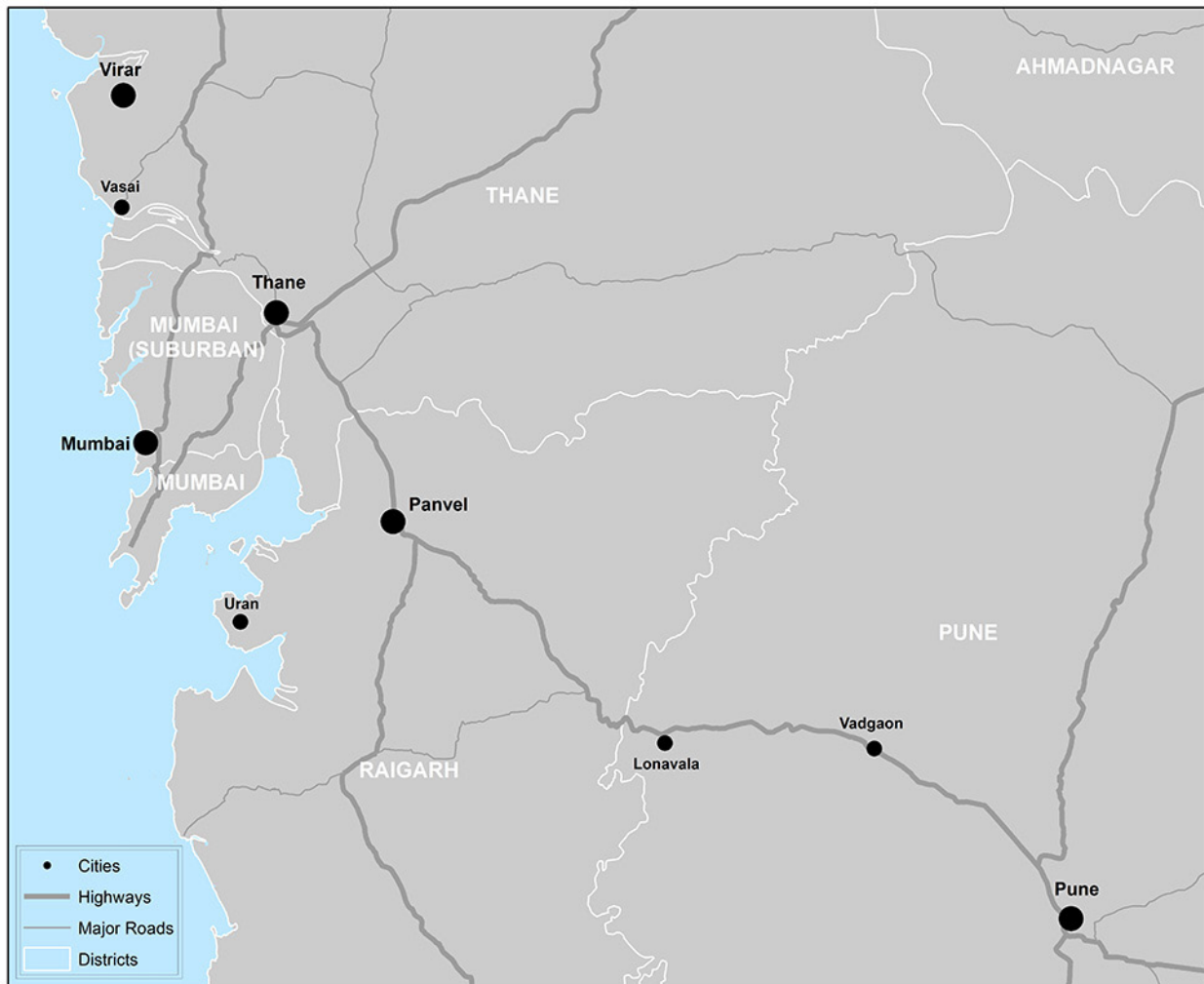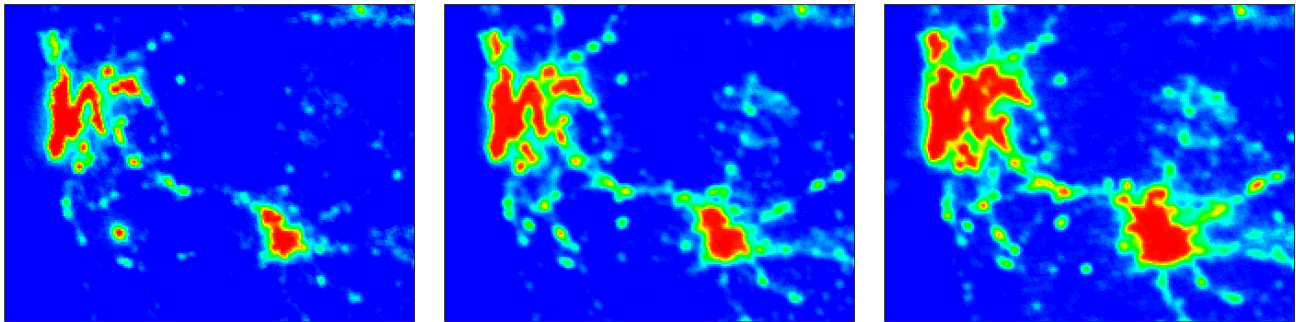
for the city population of the six major urban agglomerations, Bengaluru, Chennai, Delhi, Hyderabad, Kolkata and Mumbai for 2025. By 2030, nearly one third of the world's urban residents could reside either in India's or China's urban agglomerations.

Cities are regarded as melting pots where productivity, creativity, innovation and prosperity flourish and thereby lead to wealth creation. The growth of India's economy and its global recognition during the past two decades can be closely related to population growth and urbanization but also to reforms of economic policies in the early 1990s. After India's independence from Britain in 1947 socialist economic policies were implemented, executed by large state owned utility monopolies and a large public sector, and accompanied by agricultural subsidies and protectionism. For more than four decades economic growth and foreign investments were constrained by bureaucratic practices and lack of political will. In the wake of a fiscal crisis and near government collapse in 1991 India was bailed out by the IMF and liberalization policies opened the Indian economy to the global market. During the 1990s, as a result of these reforms, foreign direct investment increased exponentially. The nation's manufacturing sector gained ground and the private sector grew to meet the demand of the rising new middle class and cities like Bengaluru emerged as global ICT centres. The industrial sector takes advantage of an abundance of un-skilled labor whereas high-tech companies benefit from educated English speaking but low-cost knowledge workers in urban areas. Yet, most of the urban economic activity is informal and not well measured or understood (**Sidebar 1**).

India's strong domestic demand-based economy is a key determinant of the country's rapid growth and more recently its ability to endure the global financial crisis without significant damage. Thus, India's cities are competing more regionally and nationally rather than globally. However, India's global connections are expanding through a growing diaspora of Indian people in places around the globe. Economic and social conditions in India have been resulting in emigration to more prosperous countries. Young Indians go to North American or European universities and after finishing their degrees settle down permanently outside India to realize benefits of a higher income and Western lifestyle. The diaspora generates remittances and connections for India into global markets.

A total of eight Indian cities, namely the six major cities of Bengaluru, Chennai, Delhi, Hyderabad, Kolkata and Mumbai, Ahmedabad in Gujarat, and Pune in Maharashtra are included in the Citi ranking of the competitiveness of a total of 120 cities worldwide (Citi, 2013). Competitiveness is measured by weighting eight indicators, namely economic strength, physical capital, financial maturity, institutional character, social and cultural character, human capital, environment and natural hazards, and global appeal. The top 60 of the global ranking, measured for 2012, is dominated by Western cities joined by a few developed cities outside the West such as Singapore, Hong Kong and Tokyo ranking very high and emerging places such as Taipei, Seoul, Dubai, Doha, Kuala Lumpur, Shanghai, Abu Dhabi, and Beijing ranking more moderately. Mumbai and Delhi rank 67th and 69th respectively while Bengaluru ranks 86th, Ahmedabad 92nd, Hyderabad 98th, Pune 101st, and Chennai and Kolkata both ranking 105th out of a total of 120 cities worldwide (ibid.).

Delhi is described as a magnet for opportunities for businesses and people, and a place that is financially maturing and developing its social and cultural character while poorly performing in the category of environmental and natural hazards as policymakers fail to implement environmental policies that would limit pollution of water and the environment. Mumbai's competitive strengths are identified in the categories of economic strength, financial maturity, and social and

City population of the six major Indian urban agglomerations ('000)   Exhibit 8

CITY	1990	2000	2010	2025
Bengaluru	4,036	5,567	7,218	9,507
Chennai	5,338	6,353	7,547	9,909
Delhi	9,726	15,730	22,157	28,568
Hyderabad	4,193	5,445	6,751	8,894
Kolkata	10,890	13,058	15,552	20,112
Mumbai	12,308	16,086	20,041	25,810

Source: UN-Habitat 2013, p. 159.

cultural character while its competitiveness weaknesses are identified in the categories of institutional character, environmental and natural hazards, and global appeal. Yet, Mumbai is expected to be one of the top movers in the global ranking over the course of the next decade projected to climb to rank 51st until 2025 (ibid.).

However, even though overall global competitiveness will be strengthened, prosperity is not equally shared; a growing proportion of the urban population has no or only limited access to the benefits cities produce. India's economic development and growing richness come at the cost of deprivation, inequality and exclusion—physically manifesting in sprawling slums and super-rich enclaves in large cities such as Mumbai, Delhi, Chennai, Hyderabad, and Bengaluru (**Sidebar 1**). Widespread corruption, regionalism, and outdated bureaucratic structures have created a leadership vacuum in the government, transferring the responsibility for economic growth and innovation to the private sector. Moreover, nearly all of India's metropolitan regions lack any official effective urban planning expressed by an urban infrastructure that hardly keeps pace with growing urban populations, relies on improvised, private solutions—described as *jugaad* urbanism (Stolarick, 2013b) (**Sidebar 2**).

A recently invented City Prosperity Index (CPI) measures the prosperity of cities across five dimensions, namely productivity, infrastructure, quality of life, equity and environmental sustainability (UN-Habitat, 2013). The CPI relies on the Human Development Index (HDI) and is unique as it focuses on cities rather than countries. A CPI of 0.900 or higher refers to solid prosperity of cities such as New York, Toronto, London, Tokyo, Stockholm, and Zurich. A CPI of 0.599 or lower refers to weak prosperity of cities predominately located in Africa. Asian and Latin American cities mostly show moderate prosperity defined by a measure between 0.600 and 0.699. Currently the CPIs of only two cities Indian cities included in the ranking, Mumbai and Delhi, are 0.694 and 0.635 respectively. UN-Habitat characterizes moderate prosperity as evidence of wider discrepancies of the five dimensions of prosperity, institutional and structural failings, less balanced development, and a significant divide between rich and poor.

Informality in India: Housing and employment

According to UN-Habitat, informal settlements refer to residential areas built on land its occupants have no legal claim to, or land they occupy illegally, and residential or commercial buildings that were erected without following government regulations or formal planning guidelines (UN-Habitat, 2003). Informal settlements are often referred to as slums. In the Indian context, a slum is defined as "a compact settlement of at least 20 households with a collection of poorly built tenements, mostly of temporary nature, crowded together usually with inadequate sanitary and drinking facilities in unhygienic conditions" (Government of India, 2011). In fact, many slums are much larger than 20 households. Dharavi, in Mumbai, is one of the largest informal settlements in the world and houses approximately 2 million people and 60,000 structures on land barely two-thirds the size of Manhattan's Central Park (Yardley, 2011). According to the 2011 census, India's urban slum population accounts for 41 percent of Greater Mumbai, 29 percent of Kolkata, 28 percent of Chennai, and 15 percent of Delhi (Dash, 2013).

Slums provide housing and employment to people who might have otherwise remained homeless and unemployed. Experts estimate that India's informal sector, which lacks basic social and legal safeguards and benefits (ILO and WIEGO, 2012), is responsible for as much as 90 percent of all employment. Informal labor provides goods and/or services for sale or barter and gets carried out in either informal or formal enterprises or households. The majority of India's informal workers are so-called own-account workers, such as street vendors and waste pickers (Segal, 2013), who create informal employment initiatives for themselves and/or their families and do not hire other employees (WIEGO, 2013).

Slums and informal labor not only compensate for a lack of housing and formal employment they also offer opportunities. These contradicting Indian realities can be emphasized by exploring Dharavi in Mumbai along four interrelated dimensions: misery, work, politics, and hope (Yardley, 2011). *Misery* refers to the high density living and working arrangements with numerous people sharing small shanties, open sewage channels, communal toilets, and discrimination when making a loan or credit card application (ibid.). *Work* is performed with creativity in thousands of informally established and managed craft industries, such as pottery and printmaking, leather, embroidery, textile, food production, and recycling (ibid.). The merchandise is sold to domestic and global markets. Dharavi's annual output is estimated at US $600 million (ibid.). *Politics* reflect the struggle between real estate developers and Dharavi inhabitants over the land since Dharavi's land has become one of Mumbai's most valuable pieces of real estate due to its central location close to airports, train stations and an office park (ibid.). *Hope* of a better life is expressed by the desire for education, especially learning English, and embodied by local heroes like the self-made man, Mohammad Mustaqueem, 57, who arrived as a young boy with nothing and grew into a successful entrepreneur who now employs 300 people in several garment workshops that produce an annual turnover of about US $2.5 million (ibid.).

India's Jugaad Urbanization

Jugaad, originally a Punjabi term now used across India, means "good enough", or a "quick fix"; functionality without optimality. Jugaad can be an apology or an insult, an act of surrender or frustrated acceptance. Jugaad is creativity, innovation, expediency at the cost of quality. Something jugaad will work, but not for long and not well. It requires a bend — or a break — in the rules (just a little). Jugaad is India's blessing and curse; the perfect word to describe India's urbanization.

India's urbanization (built form, infrastructure, systems, and people that comprise the metropolitan region) is an assortment of quick fixes brought about by pragmatism, limited capital and infinite access to cheap labor. In metropolitan regions of several millions of people, India's basic infrastructure barely manages to keep pace with the population growth. And that is the problem. If the infrastructure actually couldn't keep up, the growth would be slowed from the overwhelming problems created from lacking infrastructure. But, the infrastructure, from a power system that leaves many in the dark for a random eight hours out of every day, to a road network that is constantly jammed, to a water and sewage system guaranteed to create a case of "Delhi belly", is jugaad. The hastily-built system, doesn't break but, instead, remains constantly at breaking point. It is not efficient nor effective, not sustainable nor optimal — but it works. However, any significant shock could quickly reduce the entire thing to an unmanageable chaos.

Much of the fault lies with governments at many levels. What is the purpose or use of planning when the events have already happened and are happening? Why should planning commissions and departments even try when senior officials (with or without external financial considerations) can override their decisions and permit construction and development that the infrastructure can't support. How do you adapt when any open space can suddenly become a homestead or impromptu small business, market, or micro-industrial site? It is said that "the good is the enemy of the great". In this case, it's not about getting to great — it's about getting from jugaad to good.

Solutions are not going to be perfect. They don't have to be. But they need to be better. Many dedicated, hard working people work in government and as civil servants. They are trying hard to make the right decisions and do the right things. They know what has to be done and they know how to do it. However, they need support; they need capital to make competitiveness a reality. They need more than jugaad solutions.

Urbanization of many Indian regions, has happened, is happening, and will continue to happen. The tidal wave of people who see and long for the benefits of joining an urban agglomeration will grow. As long as people believe that their lives will become better — even in the worst urban environments quality of life tends to rise — and even if that promise is only realized as jugaad, it is realized, and that makes urbanization unstoppable. The success of India's urbanization might be marginal, but it is still success. Finding a better way forward will be a significant challenge — can the solutions be more than jugaad?

Adapted from
Stolarick, K., "Delhi's Jugaad Urbanization", *Governance Now*, May 20, 2013.

4 THE CREATIVE ECONOMY

Creativity has become the mantra of regional economic development theory for the 21st century. Just as technology and innovation were seen as drivers of economic growth in the 20th century, today creativity plays a similar role in shaping the economic trajectories of city regions around the world. While many see the emerging economy as one that is driven by knowledge, Richard Florida (2002) suggests that it is instead driven by *creativity.*

According to Florida (2002) it is not simply the possession of knowledge and the creation of new knowledge that drives economic growth, but more importantly, the creative ideas and products that come out of such knowledge that drive continued prosperity. In other words, generating prosperity through new economic activity is more about stimulating the flow of knowledge and creative ideas found in a talented workforce than it is about simply attracting and retaining talent. The continual churning of ideas and knowledge is what leads to the creation of new products and technology and eventually new economic activity and growth. Simply attracting talent and employing it in activities that have been replicated from elsewhere is not enough.

Within the creative economy, regional economic growth is powered by the Creative Class. It is in attracting and retaining these creative workers that regions now compete. The Creative Class is one of four occupational categories defined by Florida (2002) that he derives from unique occupational groupings. According to Florida (2002), the Creative Class is characterized by workers who are not only paid to think, but more importantly, to create.

Creative Class workers tend to prefer places in which to live and work that are diverse, tolerant and open to new ideas. And these places will be the ones succeeding and growing within the emerging creative economy. However, the Creative Capital theory differs from Human Capital theory in that Creative Capital theory places more importance on the attraction and retention of a specific type of applied human capital — people in creative occupations. This distinction is important because the Creative Economy is more concerned with what people are paid to do than how many years

they have attended school. In addition to isolating Creative Capital as the driver of economic growth, Creative Capital theory, unlike Human Capital theory, points to the fact that people are active agents in making decisions about where they live and work as opposed to suggesting that certain places are simply endowed with attractive amenities. In this sense, Creative Capital theory suggests that creative workers do not follow jobs but instead make decisions regarding where to live that are independent of where to work. As such, Florida (2002) suggests the global economic hierarchy of the creative age will be determined not by access to natural resources, but by which regions are able to successfully attract and retain creative workers.

The Creative Class is often engaged in either complex problem solving, which requires a great deal of independent judgment, or in the generation of new ideas, new technology and new creative content (Florida, 2002). The Creative Class as an occupational grouping includes people employed in management, finance, law, healthcare, science, engineering, architecture, design, education, arts, music and entertainment. These workers also tend to share a common set of values that include creativity, individuality, difference and merit (Florida, 2002). The three other employment categories defined by Florida are the Service Class,[2] the Working Class,[3] and people employed in Fishing, Farming and Forestry.[4] Unlike those in the Creative Class, who are paid to think and create, the primary function of individuals employed in the Service or Working Class is to execute tasks according to a plan. The Creative Class also has a great deal of autonomy over how they perform their job, whereas the Service Class and Working Class are largely engaged in more repetitive and rudimentary tasks with less autonomy.

5 THE RISE OF THE CREATIVE CLASS

The rise of the Creative Economy in North America and parts of Western Europe is the direct result of the transition from agricultural and manufacturing activities to service and knowledge producing activities. This transition to a post-industrial economy has catalyzed a number of significant changes to their respective urban and economic landscapes. Roughly over a century ago, the economies of today's most developed countries entered into a period of industrial expansion and transformation, commonly referred to as the Industrial Revolution. During this period, economic activity shifted from agriculture in the countryside to large manufacturing industries, located in densely populated cities and urban areas. Over the course of the following fifty years, between 1900 and 1950, a number of technological improvements were made not only in manufacturing but also in communication and transportation industries. As a result of these improvements, the overall prosperity of these countries began to rise. Beginning in the 1970s, and lasting throughout the 1980s, these technological

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[2] The Service Class includes occupations in food service, custodians and groundskeepers, retail, personal care attendants, secretaries and clerical workers, and security guards.

[3] The Working Class includes occupations in manufacturing, construction and transportation.

[4] Fishing, Farming and Forestry includes occupations in resource extraction, farming and fishing.

improvements provided the opportunity for manufacturing industries to relocate to more profitable areas, mostly overseas in developing countries but also to small towns across the countryside. As these industries left, they were replaced by employment opportunities in the growing service industry. Employment in highly-paid business occupations such as those in finance, marketing and management grew alongside employment in other knowledge-intensive service occupations such as science, architecture, design, education and healthcare. Employment growth in these well-paid, knowledge-intensive occupations was mirrored by the growth of an army of people employed in low-wage service occupations, such as in food services, retail, secretarial and clerical, cultural and recreational, security and custodial occupations. In a sense, the low-paid service workers grew to provide the high-paid service workers with cheap labor to perform the tasks it was no longer productive for them to do themselves. As service industries began to dominate economic activities throughout the 1990s, the importance of knowledge work in driving growth became apparent. No longer having to monitor production facilities, companies and businesses turned to activities in product development, marketing and research. As this occurred, it became apparent that the Creative Class was beginning to play an increasingly important role in the functions of these businesses. The final turning point towards the emergence of the Creative Economy occurred in the latter half of the 1990s when it became clear that creating value was no longer simply a matter of producing and distributing existing products, but had shifted to the task of creating new content and products. While the Creative Economy has grown considerably over the past century, it was only in the last two decades that it made its most significant impact (Florida and Tinagli, 2004).

Exhibit 9 shows the changing composition of the workforce in the United States since 1800. By examining the changing composition of the workforce over time, the evolving industrial structure of the country becomes evident. Between 1900 and 1950, the dominance of manufacturing industries was apparent given the percentage of the workforce employed in the Working Class.

Over time, as technological improvements increased the productivity of manufacturing industries, the percentage of people employed in the Working Class began to decline. By the 1970s, when many manufacturing industries began to relocate to developing countries, the percentage of the workforce employed in the Working Class quickly fell (**Exhibit 10**). At the same time, with the emergence of the service economy, we see a significant growth in the percentage of the workforce employed in the Service Class, and the beginnings of faster growth in the Creative Class. Finally, by the end of the 1990s, when the creative economy really begins to grow, we see that the Creative Class as a percentage of the workforce has increased to be well above that of the Working Class. Throughout the course of this entire period, as advancements in technology were made, the percentage of people employed in agriculture and forestry steadily declined. As **Exhibit 11** illustrates, today, anywhere from 25 to 30 percent of the workforce in advanced

Changing composition of workforce in U.S. (1800–2011) Exhibit 9
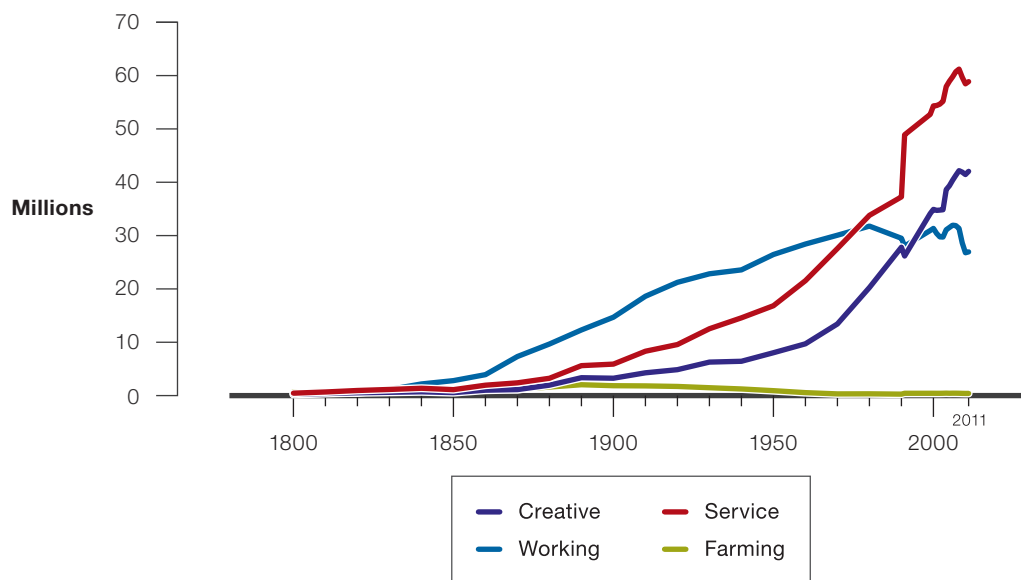
industrial nations is employed in the Creative Class (Florida and Tinagli, 2004). **Exhibit 12** shows the percentage of the workforce employed in the Creative Class in different developed and developing countries with a particular focus on the BRICS.

Just as the Industrial Revolution brought an end to the dominance of the rural economy, the rise of the creative economy is bringing an end to cities built upon single industries. Places like Pittsburgh and Detroit in the U.S. or Windsor and Oshawa in Canada are struggling to survive in a world that has passed them by (Martin Prosperity Institute, 2009b). The same situation is happening in industrial regions of China, which are struggling to maintain employment that was tied to specific industrial sectors. In the Creative Economy, the ability to mass-produce goods is less critical to economic growth than the ability to generate new ideas, concepts, products and processes.

Historical U.S. class share graph (1800–2011)
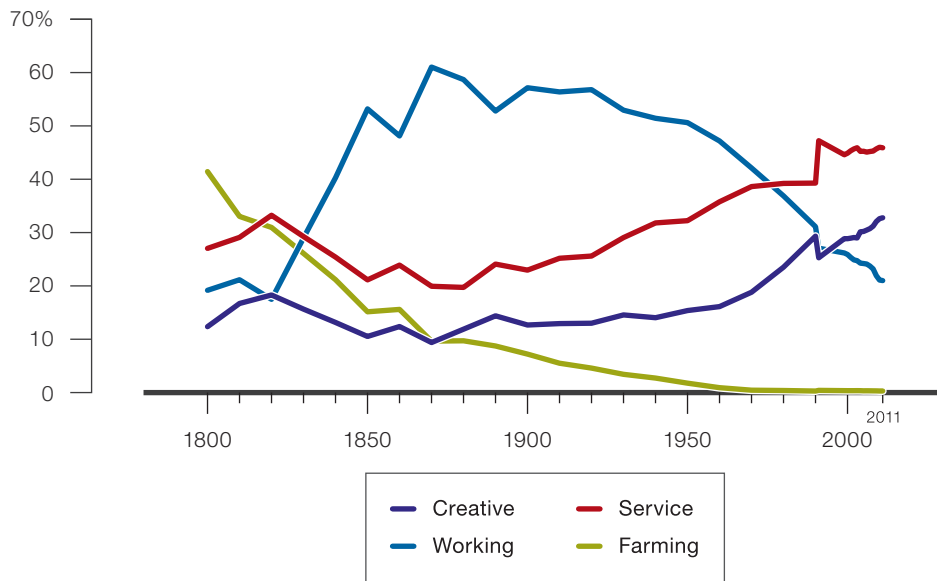
Rise of the Creative Class in U.S. (1900–2020)
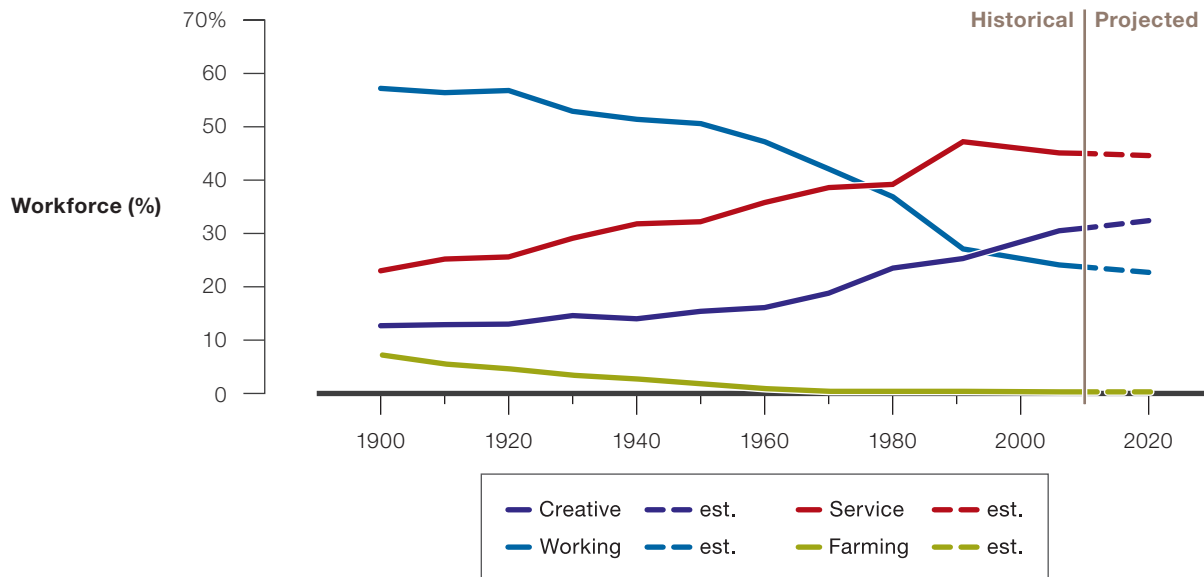
RANK	COUNTRY	CREATIVE CLASS SHARE
1	Singapore	47.30
2	Netherlands	46.24
3	Switzerland	44.84
4	Australia	44.52
11	United Kingdom	41.27
12	Canada	40.84
20	Russian Federation	38.63
27	United States	35.22
48	South Africa	21.71
57	Brazil	18.52
63	Japan	17.54
70	India	14.00
76	China	7.37

The influence of a post-industrial landscape in North America and Europe did not just affect the industrial structure of these countries—it also had significant consequences for the role of cities and urban areas. It is not a coincidence that certain global centers that have successfully attracted the Creative Class tend to be hotbeds of innovation and activity. Places like New York, London, Paris and recently San Jose (home to Silicon Valley) are all prosperous. These regions produce a continuous infusion of new ideas, and export new products, services and/or cultural trends in fashion, literature, computers or finance industries around the world.

Understanding the geography of the Creative Economy and its effects on economic outcomes rests on what Richard Florida (2002) identifies as the 3Ts of economic development, Tolerance, Talent and Technology. While each of the 3Ts is important to economic development and establishing a robust Creative Economy, no one T on its own can provide sufficient support to sustain growth and continued prosperity. To be successful, Florida argues, a region must have all three. As an example, Florida (2002) points to cities like Baltimore, St. Louis and Pittsburgh as places that have failed to grow despite having world class universities and well established technology sectors. Regions that thrive on the presence of well-established technology sectors and universities or talented workers, yet lack the openness and tolerance to attract new people from diverse backgrounds, will fail to grow if the current talent base or industries leave.

Taken together, the 3Ts of economic development produce the Creativity Index (Florida, 2002), a measure of a region's overall creative economy.

The Creativity Index measures a region's underlying creative capabilities; as opposed to simply the percentage of its workforce employed in the Creative Class (Florida, 2002). This composite measure helps to highlight the various characteristics that support the growth of a Creative Economy. In addition, it helps to consolidate all the information gathered together by the 3Ts so that they are more easily understood and helps to set regional benchmarks and gauge variations in regional creativity. To measure the global Creative Economy, Florida (2005) has developed what he calls the Global Creativity Index (GCI), which uses the same inputs as the Creativity Index except it is used to measure creativity between countries instead of cities. We will now turn to examine what Florida (2002) captures with each of these 3Ts and place it within the context of economic development in India's 50 most competitive cities.

6 THE 3TS OF ECONOMIC DEVELOPMENT IN INDIA'S CITIES

Tolerance is the first "T" of economic development. There is a growing body of research (Florida, 2002; Florida, Mellander and Stolarick, 2008; 2010; 2011) that shows how Tolerance can give nations, regions, provinces, states and cities an important economic boost as a result of being open to diversity. When places are open to newcomers, immigrants, minorities and gays and lesbians, they signal that their community is open to all types of people. Places that display these signals of openness and possess low barriers to entry for talented individuals create an environment that is attractive to the best and brightest individuals from around the world.

Yet this idea is not new. Tolerance has been recognized as essential to objective thinking since the 19th century (Mill 1859). Silicon Valley in the United States is an example of a successful region that has benefited tremendously from having an open and diverse community. According to the Martin Prosperity Institute (2009b) recent studies have found that between one third and one half of all high-tech startup companies within Silicon Valley have at least one new immigrant on their founding team. Places and firms that are open to diversity also demonstrate a greater degree of receptiveness to new ideas, intellectual freedom, risk tolerance and an entrepreneurial spirit (Martin Prosperity Institute, 2009a).

Typically, two measures are used to evaluate Tolerance within a region, namely the Visibility Minority Index and the Gay and Lesbian Index. However, due to the lack of statistical data collected and made publicly available on both groups in India, this report and also the previous report on the creative economy of India's States and Territories could not produce a reliable measure on either the numbers of individuals who identify as LBGT or those who identify as visible minorities. In the previous report on the creative economy in India's States and Union Territories, three variables, originally developed by Florida (2002) and adapted to accurately apply to the Indian context, were used to measure the level of tolerance in a region. These variables were the Mosaic Index, calculated by the concentration of schedule tribes or castes, percentage of population that is Foreign Born, Rural and Urban Literacy Divide, and finally, a Religious Herfindahl Index which measures religious diversity within a specific State or Union Territory.

In this report, three measures are combined as proxies to calculate the Tolerance Index. The index is composed by the Religious Diversity Index, population density, and female to male literacy ratio. Population density and female to male literacy are used as proxies to measure tolerance. It is assumed that growing population density increases diversity. A high female to male literacy rate refers to more gender equality in education and a city's commitment to provide basic education to its residents regardless of gender.

Talent is the second "T" of economic development. Talented individuals are responsible for generating the innovative ideas that result in newly developed technologies that can stimulate economic growth and prosperity. While incubating talent through investments in employee training and education is important, the regions that can successfully attract and retain talent will ultimately be the most competitive. Northern California is an incredibly prosperous region due to the ability of Silicon Valley to attract talented workers from all over the world. These workers have in turn created some of the most successful companies, increasing the pull of this prosperous region.

The Talent Index is used to measure the amount of Talent within a region. Talent is measured as the percentage of a region's workforce that is employed in Creative Class occupations. The Creative Class is largely responsible for generating the new and creative ideas that support economic growth and is therefore used to measure a region's level of Talent. Human Capital is an alternative measure that can be used to proxy the level of Talent within a region. When measuring Talent using Human Capital or Degree share it is calculated as the percentage of the population over the age of 25 with a bachelor's degree or higher. However, when calculating the Creativity Index, the Human Capital measure of Talent is used as a comparison measure of a region's level of Talent as opposed to the sole indicator.

In this report, five measures are combined to calculate the Talent Index. The Talent Index is composed of Creative Class share, pupil to teacher ratio higher than 35 at Upper Primary Level, male literacy rate, female literacy rate, and the number of engineering and MBA schools. Pupil to teacher ratio lower than 35 at Upper Primary Level, male literacy rate, female literacy rate, and number of engineering and MBA schools, are used as proxy for a percentage of degree share for population over the age of 25 with a bachelor's degree or higher. Due to lack of statistical data for occupations at the urban level for most Indian cities, the creative class share of respective states and territories is used whenever data for the urban level was not available. Where available, the urban creative class was determined by looking at the occupational categorization of the primary householder.

Technology is the third "T" of economic development and a critical component for any region that seeks to achieve economic growth and prosperity. The greater the extent to which technology is part of a region raises the competitiveness

of that region by improving the ability of businesses to provide new goods and services and acquire cost-saving advantages, often through productivity gains. Robert Solow (1956) and Paul Romer (1990) have found technology to be a driving force behind economic growth. Global city-regions like New York, London, Tokyo or Los Angeles have highly sophisticated technology sectors and consumers. Success in the creative age is determined by a region's ability to gain first mover advantages and market share. Regions that are able to introduce innovations more quickly, and that have well-developed high-tech industrial sectors, are able to reap significant benefits in the form of sustainable growth and the production of new wealth.

In the previous report on the creative economy in India's States and Union Territories three composite indexes were used to calculate a region's level of technological capability: Tech Connectivity, Tech Education and Computer Access. Together, these measures were used to produce what is called the Technology Index. Tech connectivity was composed of three sub-categories: the shares of households per 100,000 with broadband internet access, hard line telephone access and mobile phone access. Tech Education was measured by combining the numbers of technical universities, colleges, technical colleges, and technical research institutions in a region. Finally, internet connectivity was measured by the share of households with a computer or laptop and access to the internet.

In this report due to a lack of data on Tech Education, only Tech Connectivity and Tech Access are used to calculate a city's level of technological capability. Tech Connectivity is composed of two measures: the number of wireless broadband connection per 100,000, and the increase in the number of wireless

subscribers per 100,000. Tech Access is composed of the share of households with mobile phones, and the share of households with a computer or laptop using the internet.

7 THE PERFORMANCE OF INDIA'S 50 MOST COMPETITIVE CITIES IN THE CREATIVE ECONOMY

According to research by Florida, Mellander, and Stolarick (2011), India ranks 50th out of 82 selected developed and developing countries in the Global Creativity Index (**Exhibit 13**). India's performance on the Global Creativity Index in 2011 places the country well behind most developed countries. Compared to its BRICS peers, India falls behind the Russian Federation (30th), South Africa (45th) and Brazil (46th) but finishes a few ranks ahead of China (58th). On the individual 3T measures used to produce the Global Creativity Index, India demonstrates generally below average results. While India does not fall within the top twenty-five on any of the 3T measures according to results presented by Florida, Mellander, and Stolarick (2011), India produces its best result on the Tolerance Index — ranking 30th out of 80 countries. On the Technology Index, India ranks 42nd out of 75 countries

Global Creativity Index score for BRICS countries | Exhibit 13

		Brazil	Russia Federation	India	China	South Africa
2005 Creativity Scores and Rankings (among 45 countries)	Creativity Score	0.159	0.339	0.177	0.230	—
	Creativity Ranking	43	25	41	36	—
	Tolerance Score	0.266	0.385	0.309	0.550	—
	Tolerance Ranking	43	32	38	22	—
	Talent Score	0.128	0.521	0.085	0.031	—
	Talent Ranking	42	15	45	44	—
	Technology Score	0.083	0.112	0.137	0.109	—
	Technology Ranking	30	25	23	25	—
2011 Creativity Scores and Rankings (among 82 countries)	Creativity Score	0.451	0.646	0.402	0.305	0.463
	Creativity Ranking	46	30	50	58	45
	Tolerance Score	0.744	0.110	0.646	N/A	0.829
	Tolerance Ranking	22	74	30	N/A	15
	Talent Score	0.207	0.854	0.098	0.085	0.183
	Talent Ranking	66	13	75	76	68
	Technology Score	0.512	0.768	0.500	0.659	0.463
	Technology Ranking	41	20	42	29	45

included. On the Talent Index, India performs very poorly, ranking 75th out of 82 countries just one rank ahead of China.

An understanding of the creative economy provides key insights into the nature of India's uneven economic landscape. In order to better understand the economic geography of India's urban Creative Economy and how to build a robust Creative Economy an analysis of the 3T factors is revealing. The next sections examine each of the 3Ts of economic development across India's 50 most competitive cities. This assessment will help to shed light on the internal economic structure and development potential of these cities from a Creative Economy perspective.

Tolerance

Situated within the context of a global discussion, India is considered to be relatively tolerant compared to both developing and developed countries (Florida, Mellander, and Stolarick 2011). India ranked 30th out of 80 countries included on Florida, Mellander, and Stolarick's Global Tolerance Rankings (2011). Within the BRICS, India ranks third behind South Africa (15th) and Brazil (22nd), while finishing much higher than the Russian Federation (74th) and China, which did not appear because there wasn't enough data available to make a ranking possible.

This report adapts the methodology originally developed by Florida (2002) to measure Tolerance within India's cities. However, in order to compensate for the lack of data on visible minorities and LGBT at the urban level, a combination of proxy measures is used to calculate the Tolerance Index. The index is composed of Religious Diversity Index, population density, and female to male literacy ratio.

Religious Diversity Index[5]

Exhibit 14

Religious Diversity Index
- 0.082 - 0.192
- 0.193 - 0.252
- 0.253 - 0.329
- 0.330 - 0.439
- 0.440 - 0.598
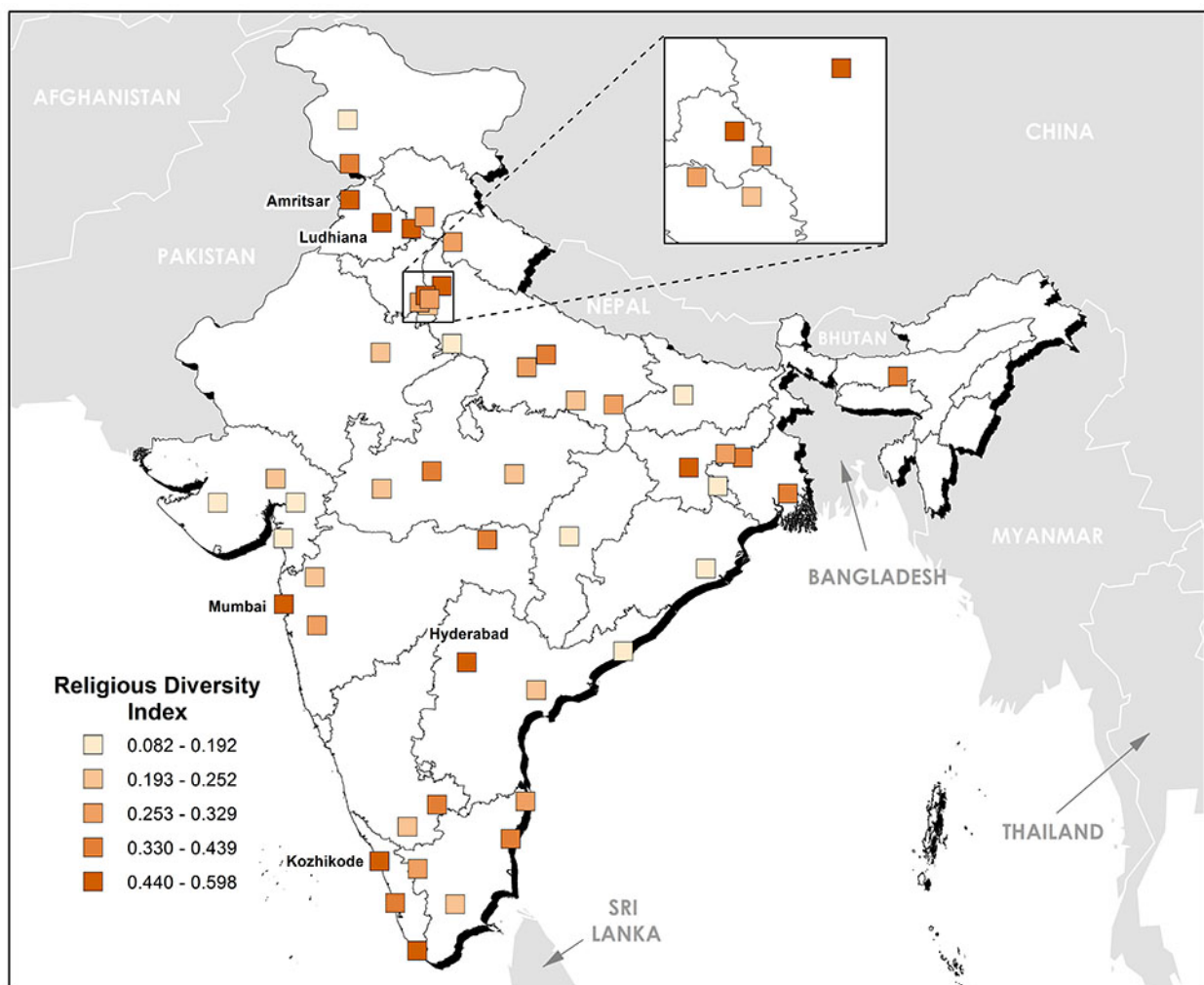
[5] Every map labels the top 5 cities.
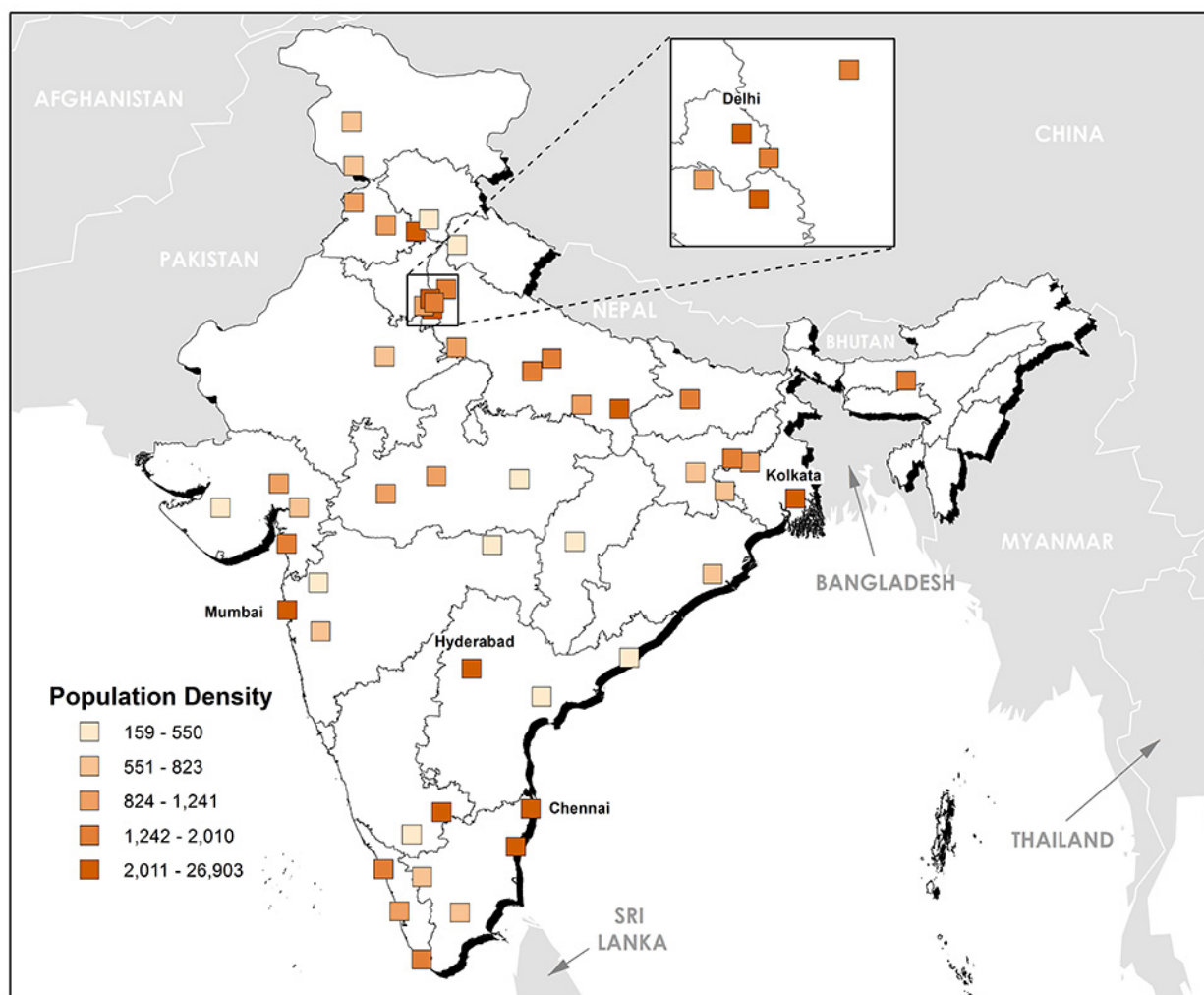
The Religious Diversity Index (**Exhibit 14**) is a different way of presenting the Religious Herfindahl Index. In the Religious Herfindahl Index higher scores correspond to a higher level of homogeneity and thus less diversity, whereas for religious diversity the scores were reversed with higher scores signaling a higher level of heterogeneity and thus more diversity. Here, 46 out of the total of 50 cities score below 0.5 which indicates most of the 50 cities tend towards religious homogeneity rather than diversity. Among the four cities scoring above 0.5 and thus leaning more towards religious heterogeneity are two of the major cities, Mumbai and Hyderabad, scoring 0.55 and 0.53 respectively, Ludhiana in Punjab with a score of 0.60 and Kozhikode in Kerala with a score 0.52. Agra in Uttar Pradesh scoring 0.19 and Srinagar in Jammu and Kashmir scoring 0.1 rank among those considered the least religiously diverse cities of all 50 cities. Over the past decades communal violence

between religious groups has been growing in India's cities. Yet, these riots have largely been driven by conflicting political and economic interests rather than actual religious animosities (**Sidebar 3**).

Population density (**Exhibit 15**) measures the density of inhabitants per square kilometre. It is assumed that there is a positive correlation between growing population density and growing diversity. Population density is measured highest in five of the major six cities. Chennai, Kolkata and Mumbai have population densities above 20,000 people per square kilometre and thus belong to the group of the most densely populated cities in the world (Demographia, 2013). The leading three are followed by

Female to Male Literacy Ratio

- 0.737 - 0.797
- 0.798 - 0.849
- 0.850 - 0.882
- 0.883 - 0.906
- 0.907 - 0.970
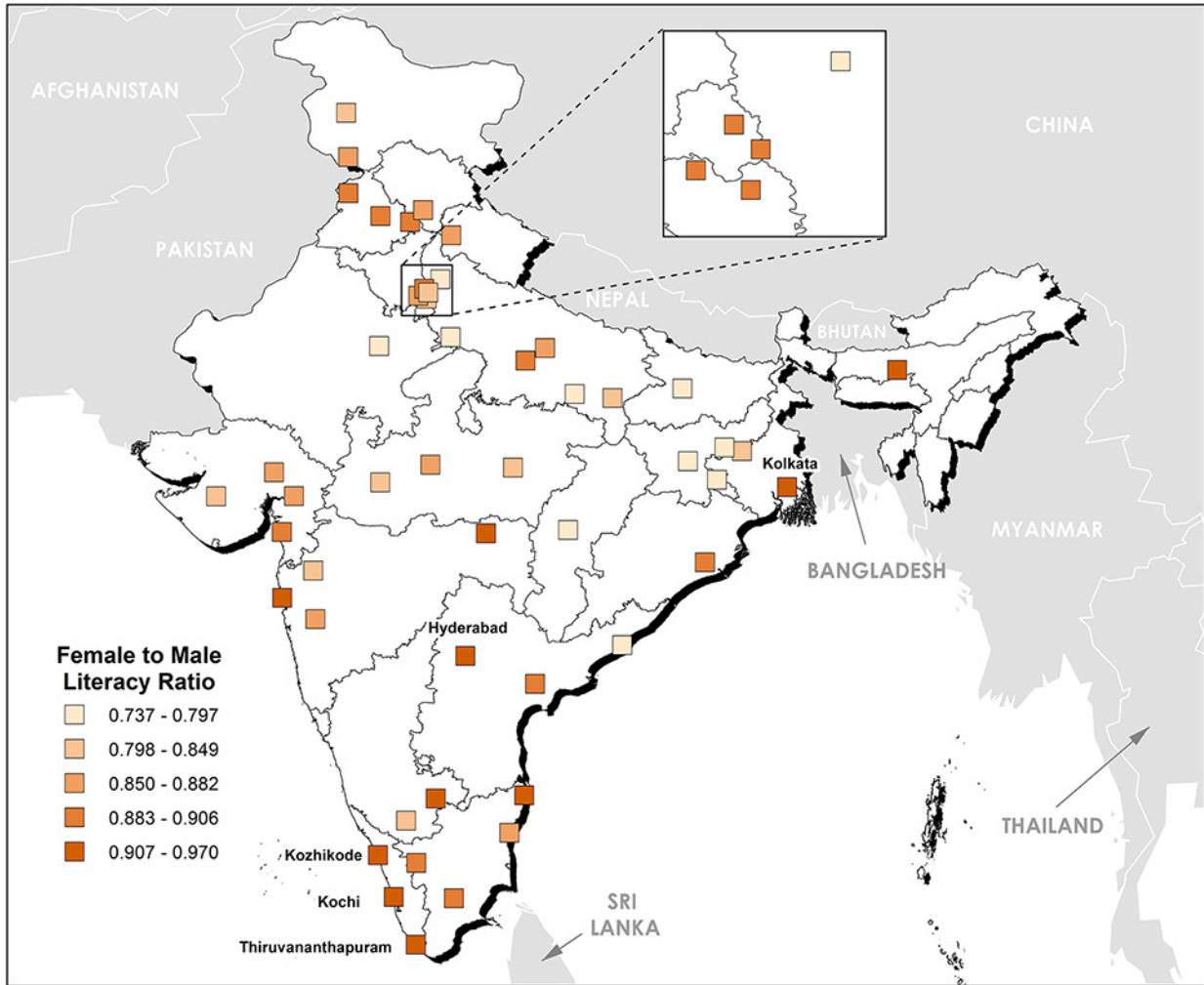
Hyderabad and Delhi ranking 4th and 5th with population densities of 18,480 and 11,297 respectively. Chandigarh ranks 5th and has a population density of 9,252 which seems to reflect intentional planning for high density from scratch. The population densities in almost all other of the 50 cities are significantly above the Indian average of 382 people per square kilometre in 2011. Only Rajkot in Gujarat, Raipur in Chhattisgarh and Shimla in Himachal Pradesh reveal lower population densities than the Indian average. Yet, their population densities of 339, 310 and 159 respectively still figure above the average population density of their respective states.

The final component of the Tolerance Index is the female to male literacy ratio (**Exhibit 16**) which is used to show the level of equality in basic education. A ratio of 1 refers to equal literacy between men and women, numbers below 1 refer to a gender gap in literacy. The ranking of the 50 cities is lead by the three cities from Kerala. Kochi, Thiruvananthapuram and Kozhikode show literacy rates close to equal literacy. These top three cities are followed by five of the six major cities, and Guwahati in Assam, and Nagpur in Maharashtra making up the top ten with rates above 0.9. Delhi ranks 16th with a female to male literacy rate of 0.89. In fact, the top 40 cities show female to male literacy rates above 0.8. All cities reveal female to male literacy rates at least equal or above the national average of 0.74.

Overall, the combination of religious diversity, population density and female to male literacy rate make up the overall

Tolerance Index of the 50 cities (**Exhibit 17**). A score closer to one signals more tolerance whereas a lower score refers to less tolerance. Here, the Tolerance Index ranges between 0.94 and 0.07. The top 10 consists of the six major cities, Thiruvananthapuram and Kozhikode in Kerala, Guwahati in Assam and Chandigarh with scores above 0.8. The third city in Kerala, Kochi, follows on rank 11 with a score of 0.77. Pune in Maharashtra, considered an up-and-coming place for the LGBT community (**Sidebar 4**), ranks with a score of 0.42 relatively low on rank 31.

The Tolerance Index for India's 50 most competitive cities emphasizes the previous results of the Tolerance Index for India's States and Territories which revealed that regions with major metropolitan regions and the state of Kerala score relatively high while central regions score lower (Martin Prosperity Institute, 2013).

Talent

In global comparison India ranks 75th out of 82 developed and developing countries from around the world on the Talent Index, as measured by Florida, Mellander and Stolarick (2011). On this same Index, the Russian Federation outperforms the other BRICS countries, ranking 13th overall, followed by Brazil (66th), South Africa (68th), India (75th), and China (76th). India's poor performance on the Talent Index places the country well behind other developing countries in Asia, such as Malaysia (50th), Sri Lanka (55th), and Thailand (56th), and only slightly ahead of Vietnam (78th), Indonesia (80th), and Cambodia (81st) out of the 82 countries included (ibid).

Sidebar 3

Riots as a Way of Promoting Political and Economic Interests?

Communal riots are a distinct feature of communalism in India (Rajeshwari, 2004). A communal riot is generally characterized by two or more different groups violently confronting each other (Human Rights Watch, 1996). Evidence about riots in India can be traced back to the 1700s; however, riots on a significant scale did not occur until 1946/47.

Since Independence, communal violence between religious groups has been growing in India's cities. Yet, these riots have largely been driven by conflicting political and economic interests rather than actual religious animosities (Rajeshwari, 2004). Between the 1960 and 1980s, communal riots occurred mostly in cities in industrial regions with significant Muslim populations pursuing different political and economic goals than the local Hindu populations. Since the 1990s communal riots have been reflecting the shifts in the political landscape. With the relative decline of the Indian National Congress (INC), a leader in the Indian Independence Movement and the nation's dominant political party thereafter, and the emergence of nationalist organizations such as the Bharatiya Janata Party (BJP) the calling for Hindu unity has become louder and religious sentiments have been manipulated and instrumentalized to cause communal riots (Nayyar, 2013; Rajeshwari, 2004). Since then, communal riots have expanded all over India becoming a feature of both rural and urban areas in almost all Indian States. Since 1967, 58 major communal riots in 47 places had been counted with a total death toll of 12,828 people (Naqvi and Koppikar, 2012). The 1990s accounted for the highest share of riots during the past five decades with a total of 23 riots, the 1980s saw 14, the 1970s seven and the last decade 13 riots (ibid.).

During the past five decades, Ahmedabad has seen five major riots, Hyderabad four but Calcutta none (ibid.). Communal riots and violence have negative effects on society, ranging from harming people, children missing school and daily workers losing income because of curfews, to growing media coverage that may damage India's reputation internationally. Although communal riots are generally disapproved by both governments and civil society these stakeholders don't take action and remain rather passive in many States, i.e. religious festivals and processions which often appear to be starting points for riots still lack sufficient security (Rajeshwari, 2004).

Queer Culture in India's Cities

There is no reliable data available on the number of LGBT people in India. Estimates range between a government released number of 2.5 million (BBC, 2012) and a Kinsey scale estimate of 50 to 100 million LGBT people (Gera, 2013). Yet homosexuality was only decriminalized by the Delhi High Court in 2009 (BBC, 2012). Although India has been more progressive than other emerging South East Asian countries, gay, lesbian, bisexual and transgendered individuals are still socially stigmatized, ridiculed, excluded, and harassed (Frost, 2012). Nevertheless, since the decriminalization, a vibrant and hip LGTB nightlife and activist scene has grown in Mumbai, Delhi, Kolkata, Chennai and Bangalore. Pride parades, art exhibitions and film festivals taking place not only in these major cities but also in smaller cities such as Ahmedabad, Bhubaneswar, Madurai, Pune and Thrissur/Kerala celebrate the LGBT culture and promote increased acceptance through more public visibility. Bollywood and Indian television networks have started to include gay characters into their productions. The internet has also created additional opportunities for India's LGBT community to connect through numerous dating websites, blogs, and online magazines like *Pink Pages*. According to *Pink Pages* (2012), India's most gay friendly city (in 2012) was Mumbai followed by Delhi, Bangalore, Kolkata, and Chennai on subsequent ranks, with Pune considered an up-and-coming place for the LGBT community.

Tolerance Index   Exhibit 17

Tolerance Index
- 0.073 - 0.267
- 0.268 - 0.420
- 0.421 - 0.520
- 0.521 - 0.767
- 0.768 - 0.940

Exhibit 18
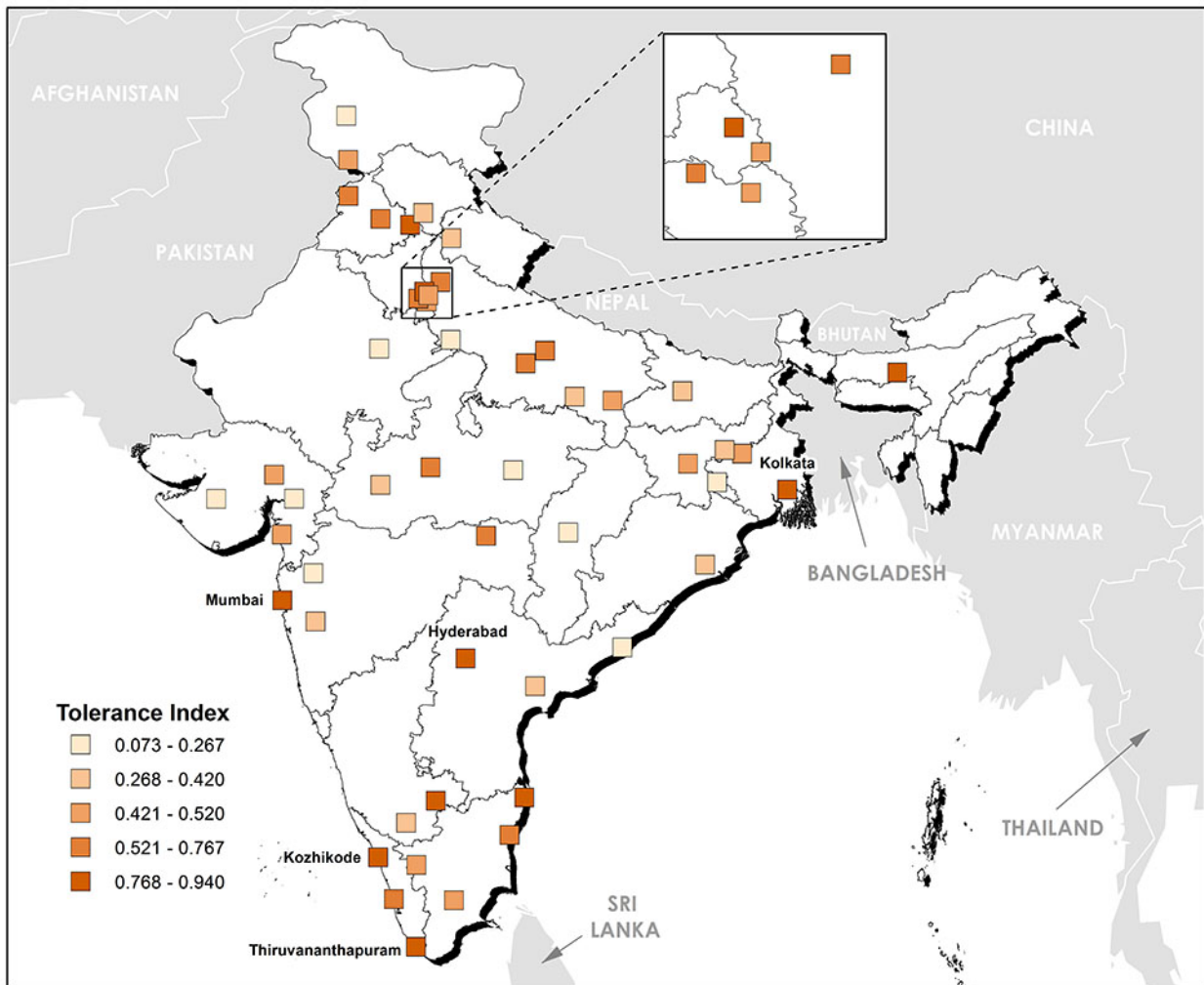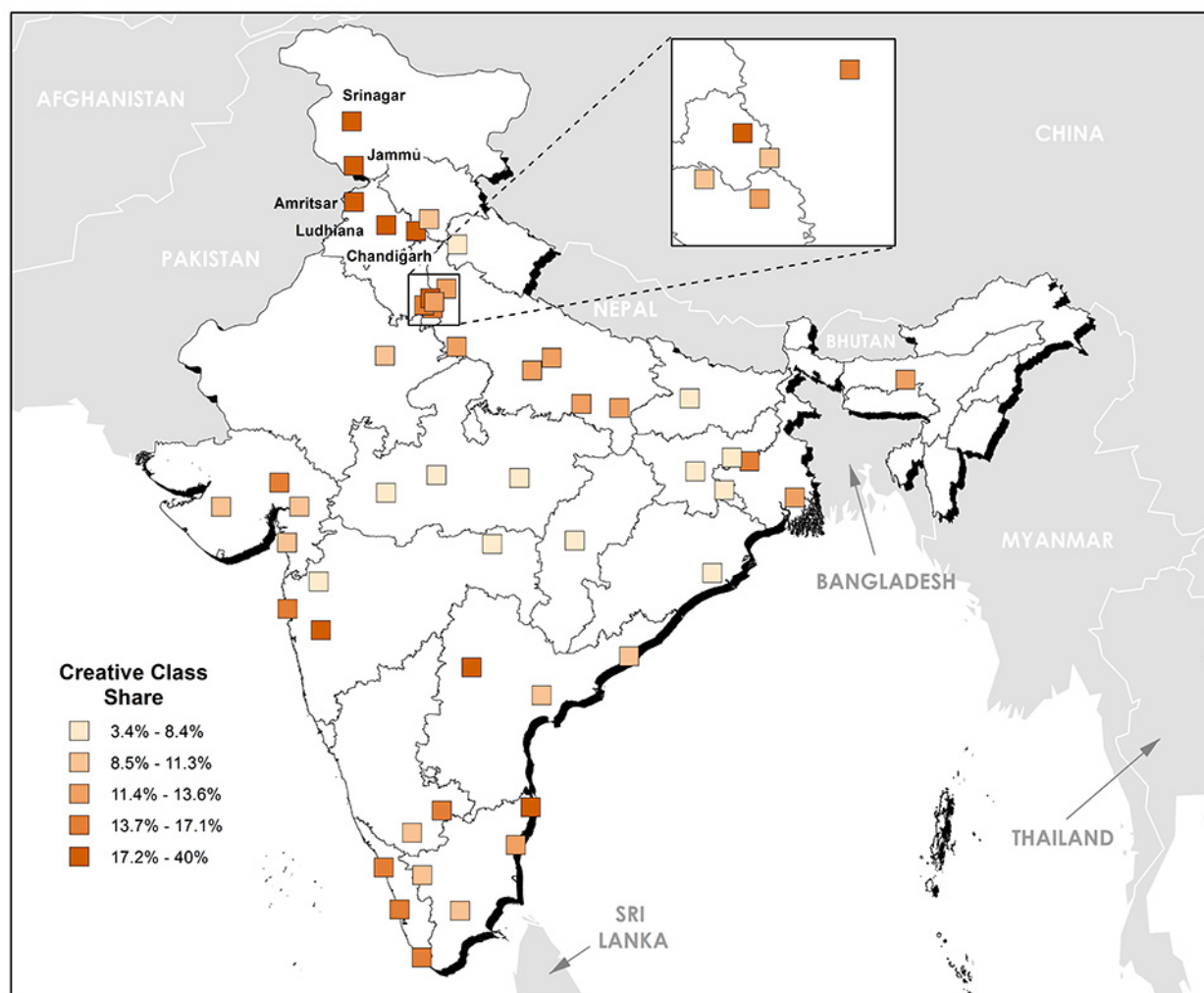
In this report, creative class share and a proxy for degree share are combined to calculate the Talent Index. Yet the Creative Class reflects only the actual share at the urban level where occupational data was available; for those cities where occupational data was not available at the urban level the creative class share of their respective state or territory is used as a proxy instead (Martin Prosperity Institute, 2013). Due to a lack of data of the 'share of the population over the age of 25 with a bachelor degree or higher' at the urban level four other educational measures are used as a proxy. This proxy measure combines measures for pupil to teacher ratio lower than 35 at Upper Primary Level, male literacy rate, female literacy rate, and the number of engineering and MBA schools.

The share of the creative class in a city (**Exhibit 18**) signals the degree of the shift from an industrial to a post-industrial creative and knowledge economy. In the top three of India's cities the creative class accounts for shares of more than one third of the respective workforces. Jammu and Srinagar in Jammu & Kashmir rank 1st and 2nd with shares of 40 percent respectively followed by Chandigarh ranking 3rd with a share of 37 percent. Ludhiana and Amritsar in Punjab rank 4th and 5th with shares of 24 percent respectively. The six major Tier-I cities show creative class shares between 16 percent and 23 percent with the exception of Kolkata which shows a slightly lower share of 13 percent. The emerging Tier-I cities Farid-abad and Gurgaon in Haryana and the Tier-II cities Pune in Maharashtra, Ahmedabad in Gujarat as well as the three Kerala cities, Thiruvananthapuram, Kochi and Kozhikode rank relatively high with shares between 14 percent and 19 percent. **Sidebar 5** takes a
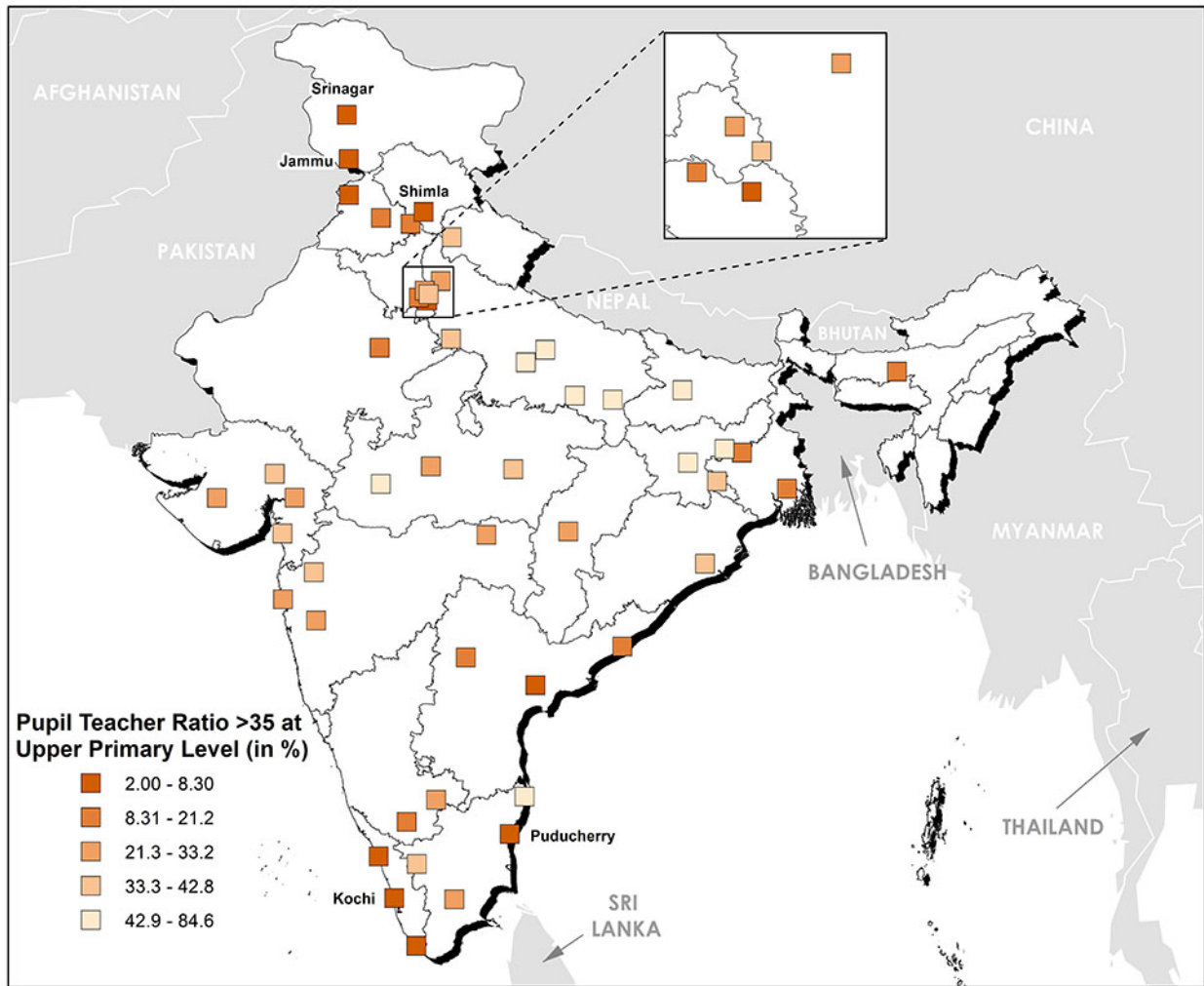
snapshot of the growing contemporary visual art scene in India which reflects a growing interest in art and culture and has been ascribed as a key characteristic of the creative class (Florida, 2002).

The Pupil Teacher Ratio at Upper Primary Level (**Exhibit 19**) measures how many students are supervised by one teacher in class and is used an in indicator for the quality of education. A small percentage in this ranking refers to a small amount of unfavorable pupil teacher ratios above 35 in class. In other words, growing percentages in this ranking signal to a growing amount of unfavorable pupil teacher ratios above 35 in class. The ranking reveals that Tier-II cities such as the three cities from Kerala, Kochi, Thiruvananthapuram and

Kozhikode, ranking 3rd, 6th and 7th respectively, show very low percentages of unfavorable pupil teacher ratios. Among the major Tier-I cities Hyderabad and Kolkata score highest and rank 13th and 14th respectively. Mumbai, Delhi and Bengaluru rank 24th, 26th and 27th respectively and show higher percentages of unfavorable pupil teacher relations but still more favorable ones than Chennai, the sixth major Tier-I city, which ranks only 41st.

India's Contemporary Art Scene Gains Momentum

In recent years, the Indian contemporary visual art scene has been growing. Arts education has expanded and the number of venues and events has been increasing ranging from art festivals, art fairs, auctions, public and private museums to alternative spaces (Dhingra, 2012; Siddiqui, 2012, Yee, 2012).

Demand for Indian contemporary visual art is driven by the super-rich and an emerging middle class of young professionals who discover a passion for art and culture and appreciation of artistic traditions but also follow a growing belief in art as a promising alterative investment (Fasche, 2013). In 2012, the first biennale in India, the Kochi-Muziris Biennale in Kerala, was inaugurated (Chatterjee, 2011). The biennale showcased artworks in various media by Indian artists and by international acclaimed artists such as Wangechi Mutu, Ernesto Neto, and Ai Weiwei (Kochi-Muziris Biennale, 2012). The exhibition was accompanied by an education program for connoisseurs, students and children (ibid). The biennale fostered appreciation of creativity and regional artistic traditions and put Kochi on the international cultural map (George, 2013).

Rising global interest in the Indian contemporary visual art scene is reflected by participation of international renowned galleries at the India Art Fair in Delhi (Siddiqui, 2012) and acknowledgement and legitimation of art from India by reputable international museums. For example, TATE in London recently established a South Asian Acquisition Committee (SACC) that recommends acquisitions of modern and contemporary artworks from India and neighboring countries for integration into the TATE collection (Kalra, 2013).

Yet despite growing recognition the potential of India's contemporary visual art scene seem to be constrained by a weak institutional infrastructure. Academic education, curation and criticism, as well as knowledge about preservation and display need to be strengthened (Lalwani, 2013) to support and multiply the work of committed artists, gallerists, collectors and other art world stakeholders — or, in the words of Lekka Poddar, a collector and co-founder of Devi Art Foundation in Gurgaon "how are we going to sustain the top of the pyramid when there is no base?" (ibid.).

Literacy Rate: Male
- 75.5 - 83.4
- 83.5 - 86.5
- 86.6 - 89.8
- 89.9 - 91.8
- 91.9 - 97.6
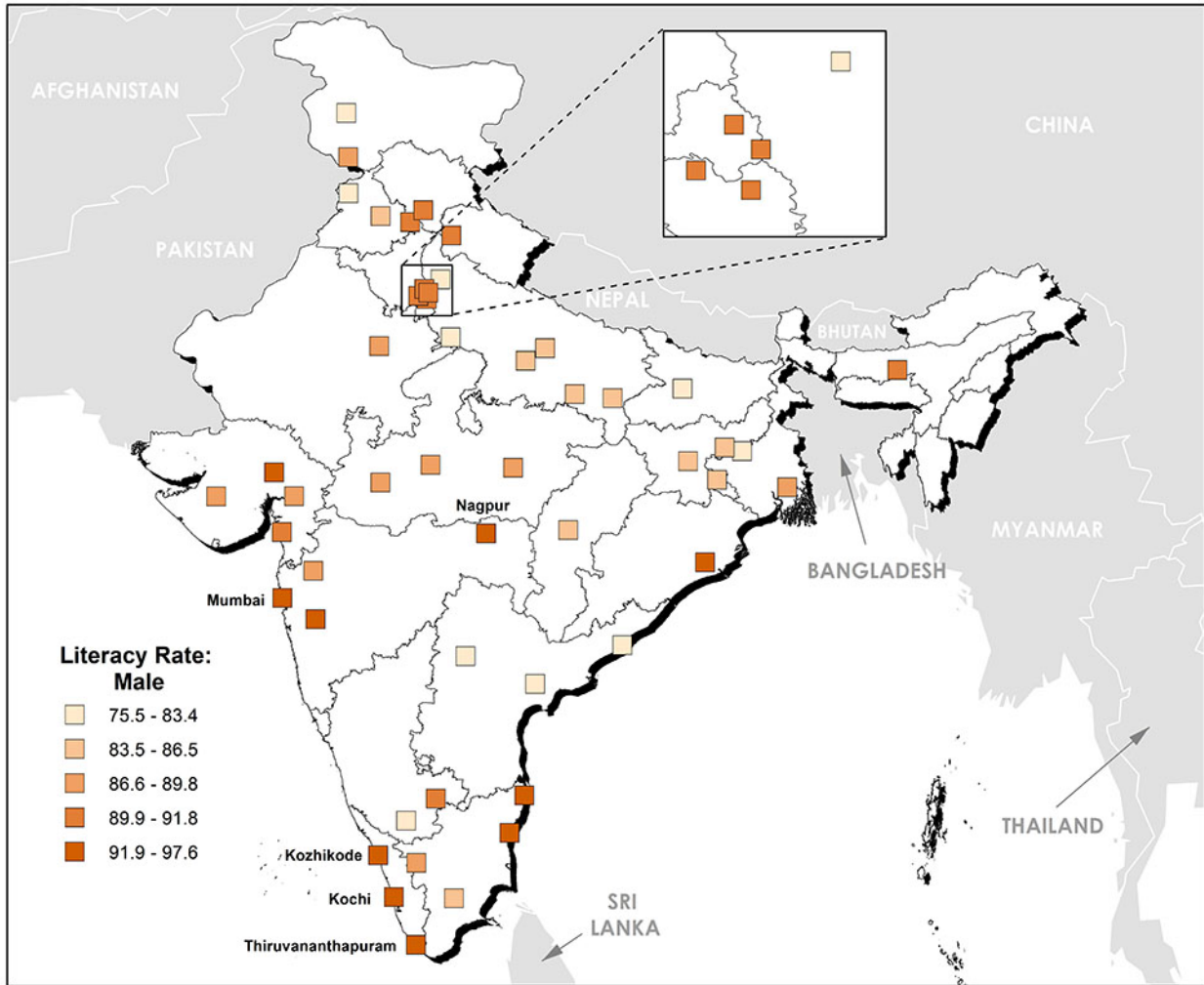
The literacy rate male (**Exhibit 20**) measures the percentage of literate men. Here, the literacy rate in India's 50 cities ranges between 97.6 percent and 75.5 percent. The ranking reveals a literacy rate of 90 percent and higher among the top 20 cities. The three Kerala cities, Kozhikode, Kochi and Thiruvananthapuram score highest. Out of the six major cities Mumbai, Chennai, Bengaluru and Delhi show literacy rates above 90 percent closely followed by Kolkata with a share of 89 percent. Yet, the top 43 of the 50 cities reveal literacy rates above the country-wide average male literacy rate of 82.1 percent which includes the sixth of the six major cities, Hyderabad, ranking 42nd with a share of 83.4 percent.
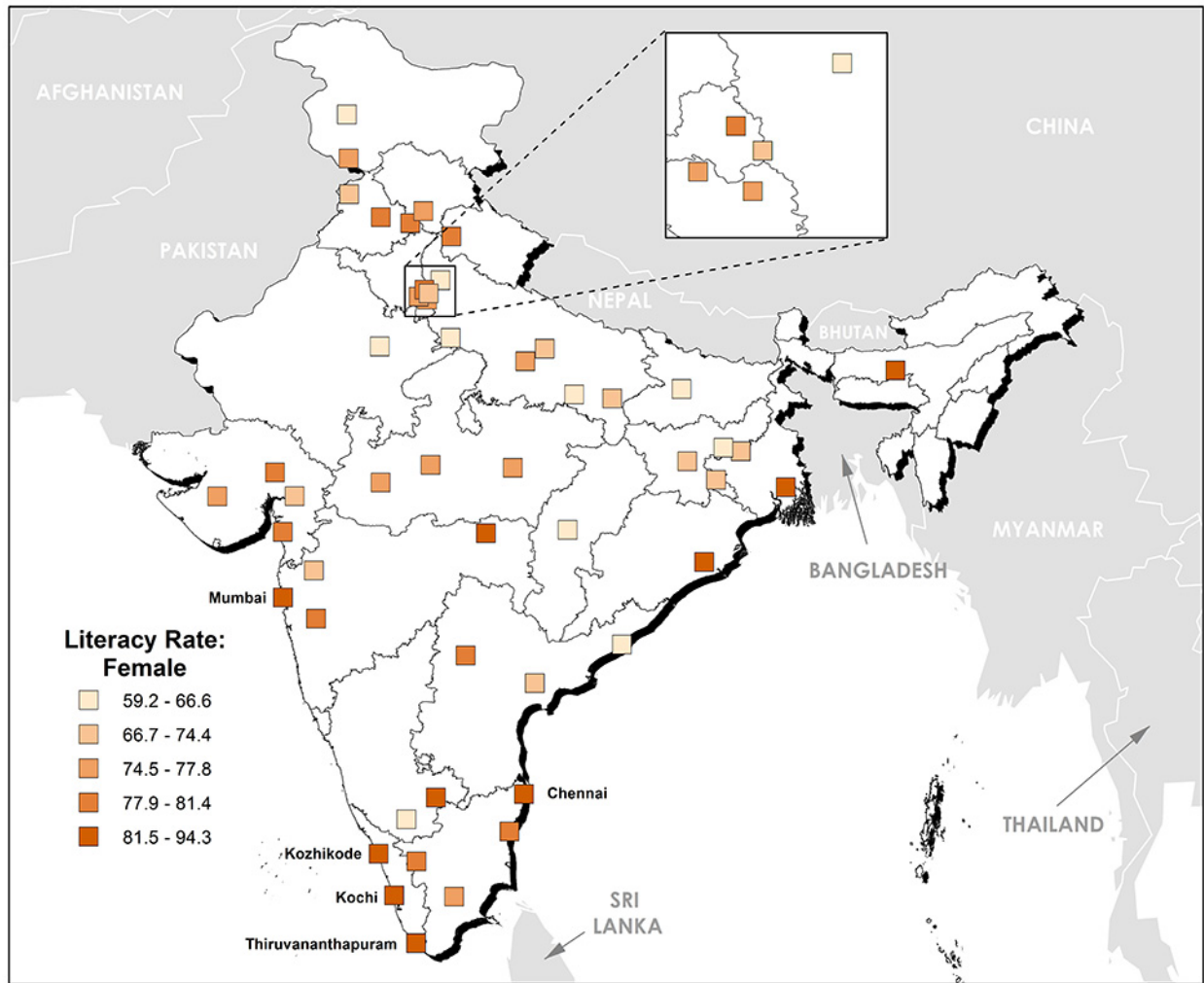
Exhibit 21

The literacy rate female (**Exhibit 21**) measures the percentage of literate females. Here, the literacy rate in India's 50 cities ranges between 94.3 percent and 59.2 percent. Only the top three cities, the three Kerala cities, Kozhikode, Kochi and Thiruvananthapuram score above 90 percent. Just the top 16 cities show literacy rates of 80 percent or higher but the top 43 cities still score above the country-wide average female literacy rate of 65.4 percent. The six major cities are ranked in the top 20.
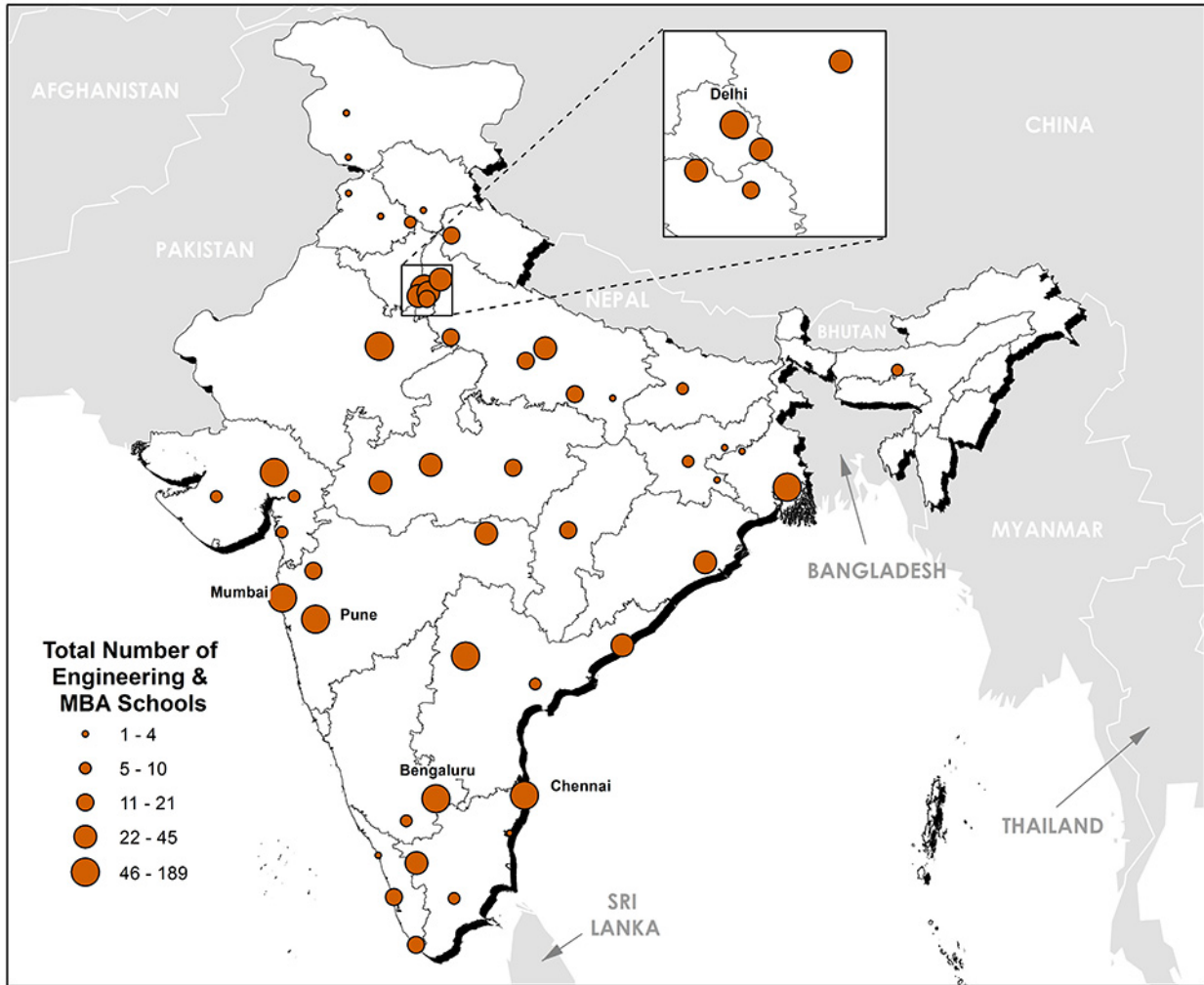
The total number of MBA and engineering schools for all 50 cities (**Exhibit 22**) ranges between 189 in Bengaluru and 1 in Kozhikode in Kerala, Amritsar in Punjab, Dhanbad and Jamshedpur in Jharkhand. The ranking largely reflects a correlation between city size and number of schools. The six major cities, or Tier-I cities, rank highest followed by the other Tier-I cities, and Tier-II and Tier-III cities. The six major cities and Pune have more than 100 schools, the top 22 cities have 20 or more schools, and the top 33 cities have at least 10 or more schools. **Sidebar 6** sheds light on the local and global challenges the Indian university system is facing.
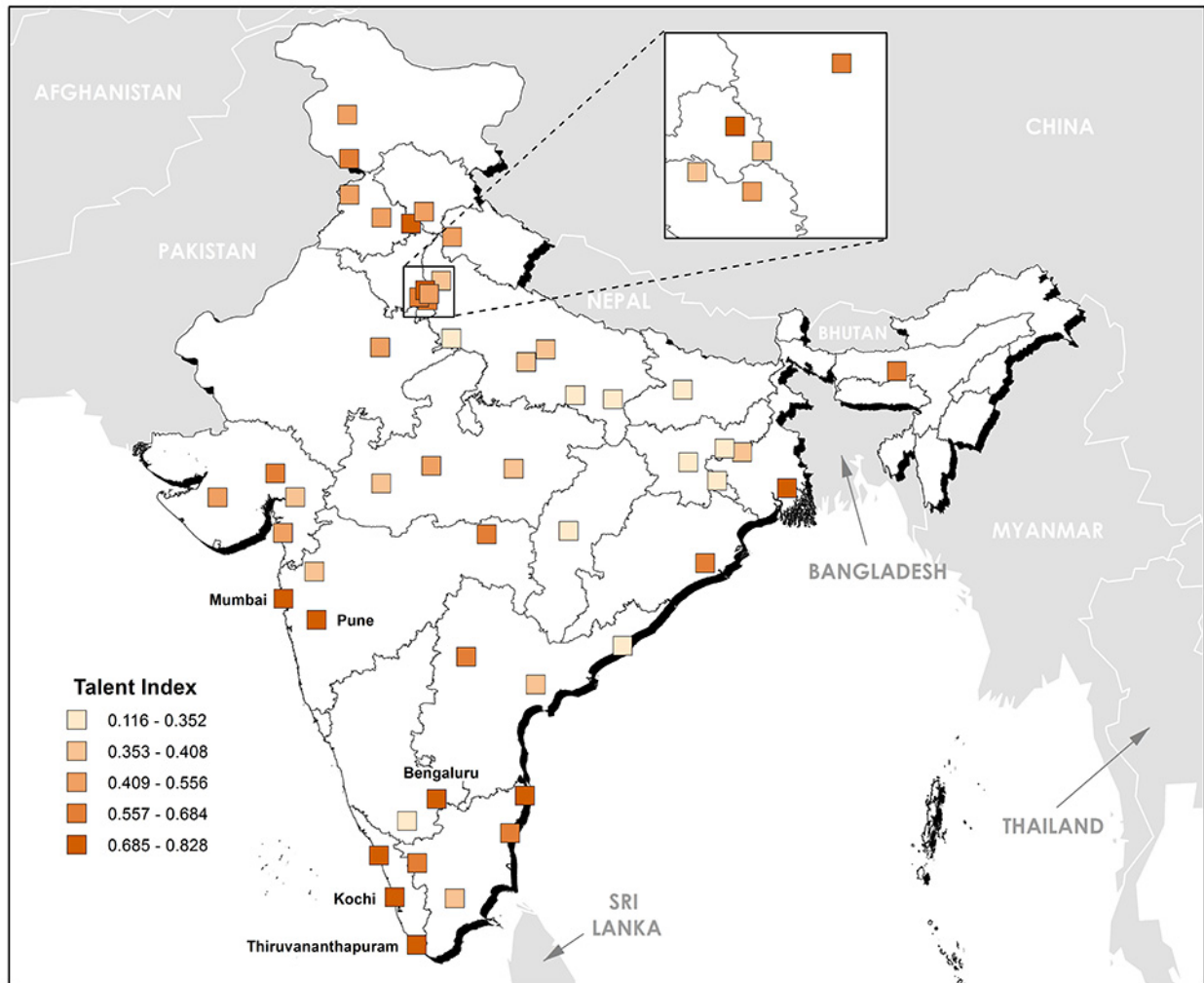
Exhibit 23

Overall, the combination of creative class share and the four measures as proxy for the share of the population over the age of 25 with a bachelor degree or higher make up the overall Talent Index (**Exhibit 23**). A score closer to 1 signals a higher share of talent whereas a lower score refers to a smaller share of talent. Here, the Talent Index ranges between 0.83 and 0.12. At least 22 cities out of the 50 cities show indices above average. Kochi in Kerala ranks 1st with an index of 0.83 closely followed by Mumbai ranking 2nd and Thiruvananthapuram in Kerala ranking 3rd with indices of 0.82 and 0.79 respectively. The other major cities, with the exception of Hyderabad which ranks 13th with a slightly lower index of 0.67, Pune in Maharashtra, Kozhikode in Kerala and Chandigarh complete the top 10 of the 50 cities with indices ranging between 0.69 and 0.78.

The Talent Index for India's 50 most competitive cities emphasizes the previous results of the Talent Index for India's States and Territories which revealed that the Talent Index scores relatively high in regions with major urban areas and in Kerala in the South.

India's Higher Education between Global Competition and National Needs

Higher education institutions worldwide are increasingly challenged to compete for global recognition of research excellence and performance, while also having to serve the educational needs of their respective countries. In the most recent influential World University Rankings for 2012–13 that include the Academic Ranking of World Universities (ARWU) by the Shanghai-based Jiao Tong University, the QS World University Rankings by the UK-based publishing company Quacquarelli Symonds (QS), and the Times Higher Education World University Rankings by the London-based magazine *Times Higher Education* (THE), no Indian university shows up among the top 200 universities of the world. Yet, in the Times Higher Education World University Rankings three Indian institutions achieve positions among the global top 400 universities, namely the Indian Institutes of Technology (IITs) in Kharagpur north of Delhi ranking 226–250, in Mumbai ranking 251–275, in Roorkee west of Kolkata ranking 351–400.

However, against this backdrop India's higher education system is not only challenged to cultivate international excellence but also balance it with expansion and equity. While India needs to improve the overall research quality and performance of its higher education institutions in international comparison, the country also needs to nurture talent for the continuing shifts towards a creative and knowledge economy and provide access to higher education opportunities for the upcoming generation.

India's government aims to increase the number of university enrollment from currently 12 million to over 30 million by 2025 which then would compare to the education attainment levels of many Western countries and make India one of the largest higher education systems worldwide (Sharma, 2011). The projected growth in the number of students is accompanied by a growth in the number of higher education institutions estimated to rise from currently 370 to 1,500 (ibid.). Hundreds of institutions are being founded ranging from large public universities in India's states, new prestigious Indian Institutes of Technology (IITs) and Indian Institutes of Management (IIMs), to private universities and collaborations with institutions from around the world (ibid.). In 2012 new rules were implemented which allow the top 500 globally ranked institutions to partner with Indian universities (Mishra, 2013). Foreign institutions, particularly from the U.S., UK and Canada are collaborating with Indian institutions to offer dual degrees and foster joint research. Some Western institutions are considering establishing branch campuses in India.

International collaborations can help to push international research and teaching standards by re-examining curricula, research goals and governance structures, building powerful national and global networks of faculty and students, and recognizing India's strengths and potentials. However, there is also concern about a growing divide in access to higher education if only a minority of the population may be able to afford the tuition fees of private and international universities (Sharma, 2011).

Exhibit 24
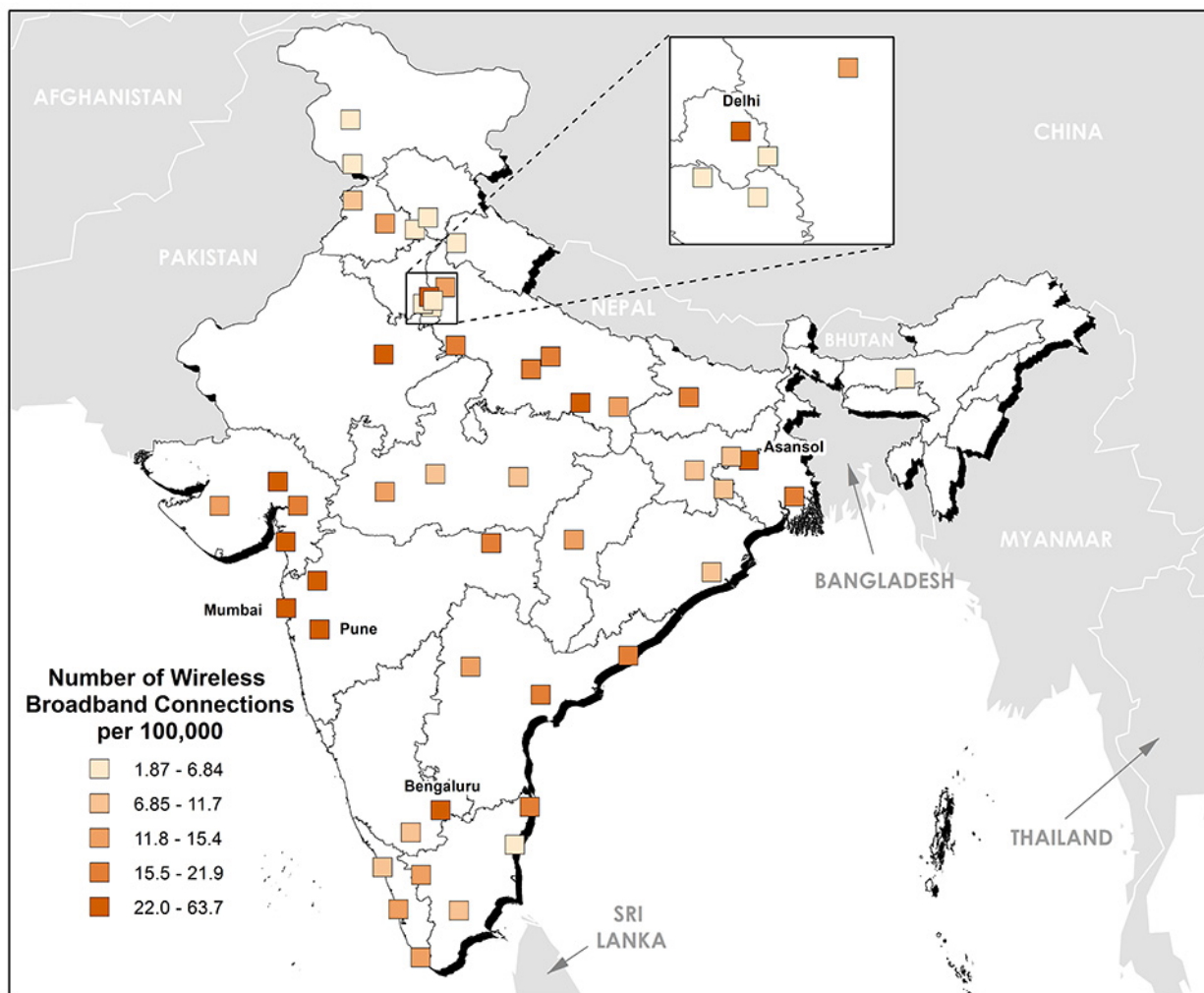
Technology

On a global level when compared to 75 other countries, India ranks 42nd and performs better than most developing countries, such as Malaysia (54th) and Thailand (64th), but ranks significantly below developed Asian countries such as Japan (2nd), Singapore (10th) and Hong Kong (21st) (Florida, Mellander, and Stolarick 2011). Among the BRICS countries India ranks just above South Africa (45th) but well below the Russian Federation (20th) and China (29th) (ibid.).

In this report, due to a lack of data for Tech Education technology is only measured by Tech Connectivity and Tech Access. Tech Connectivity is measured by the number of wireless broadband connections per 100,000, and the increase in the number of wireless subscribers per 100,000. Tech Access is measured by the share of households with mobile phones, and the share of households using a computer or laptop to use the internet. The Technology Index is composed of the two measures for Tech Connectivity and Tech Access respectively.

The number of wireless broadband connections is measured per 100,000 people (**Exhibit 24**). Delhi ranks first with 63.66 wireless connections per 100,000 people or 0.06 percent of the total population. Mumbai and Bengaluru rank 2nd and 3rd with 0.04 and 0.03 percent of the total population respectively. The rates of less than one percent of broadband connections per 100,000 people in all 50 selected cities appear to be at a very low level when compared to the current OECD average of 26,300 connections per 100,000 people but similar to levels in other developing countries (OECD, 2012a). **Sidebar 7** reveals a success

Exhibit 25

Increase in the number of wireless subscribers per 100,000
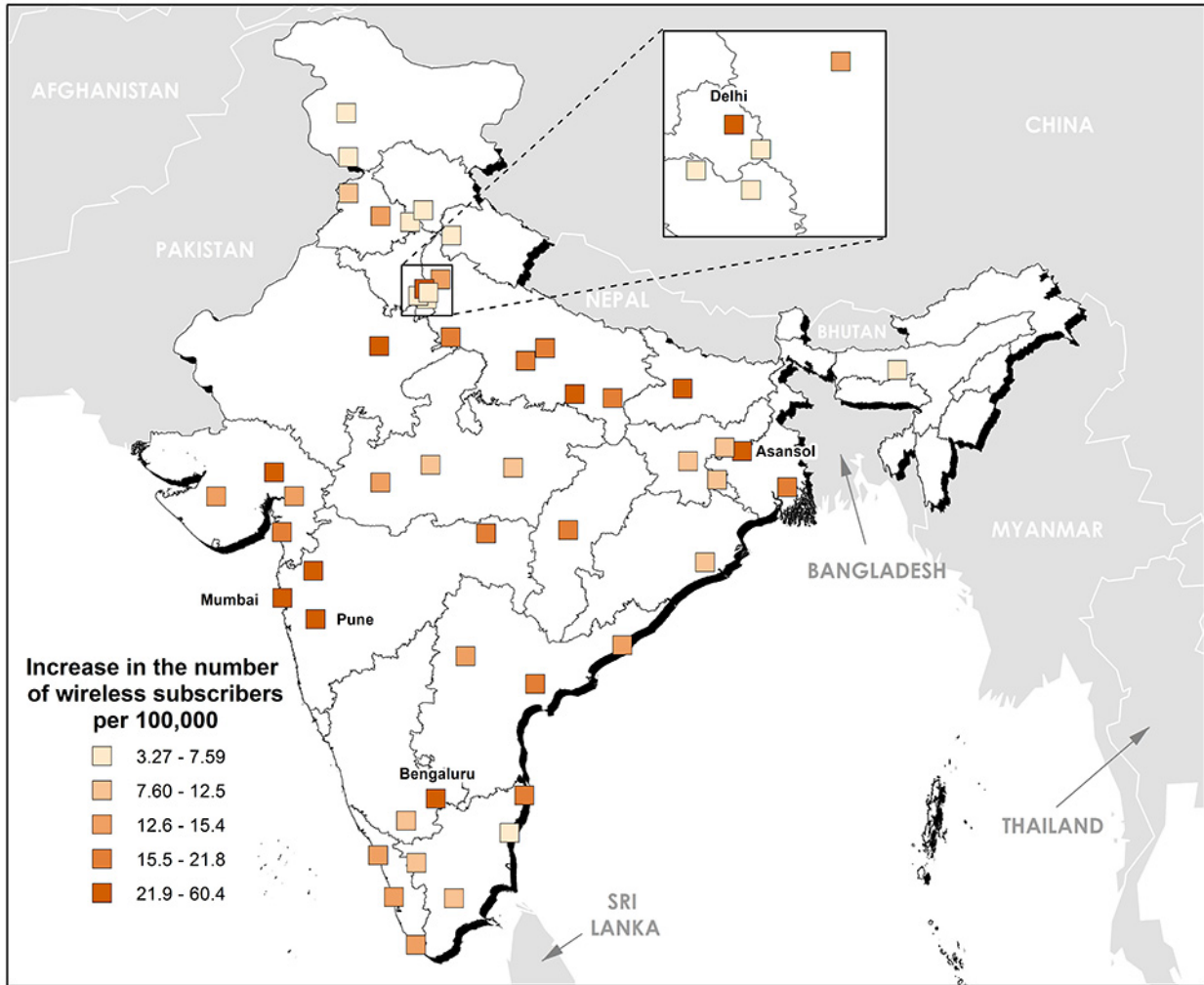
story of a tech start-up closely associated with the growing creative and knowledge economy (Florida, 2002).

The increase in the number of wireless subscribers per 100,000 people between 2001 and 2011 (**Exhibit 25**) nearly reflect the number of wireless broadband connections per 100,000 people in 2011 revealing the early state of digital development in India's cities. However, in 2003 the OECD average rate of broadband connections was just 7.2 percent revealing the digital growth dynamic between 2003 and 2012 in developed countries (OECD, 2012b).
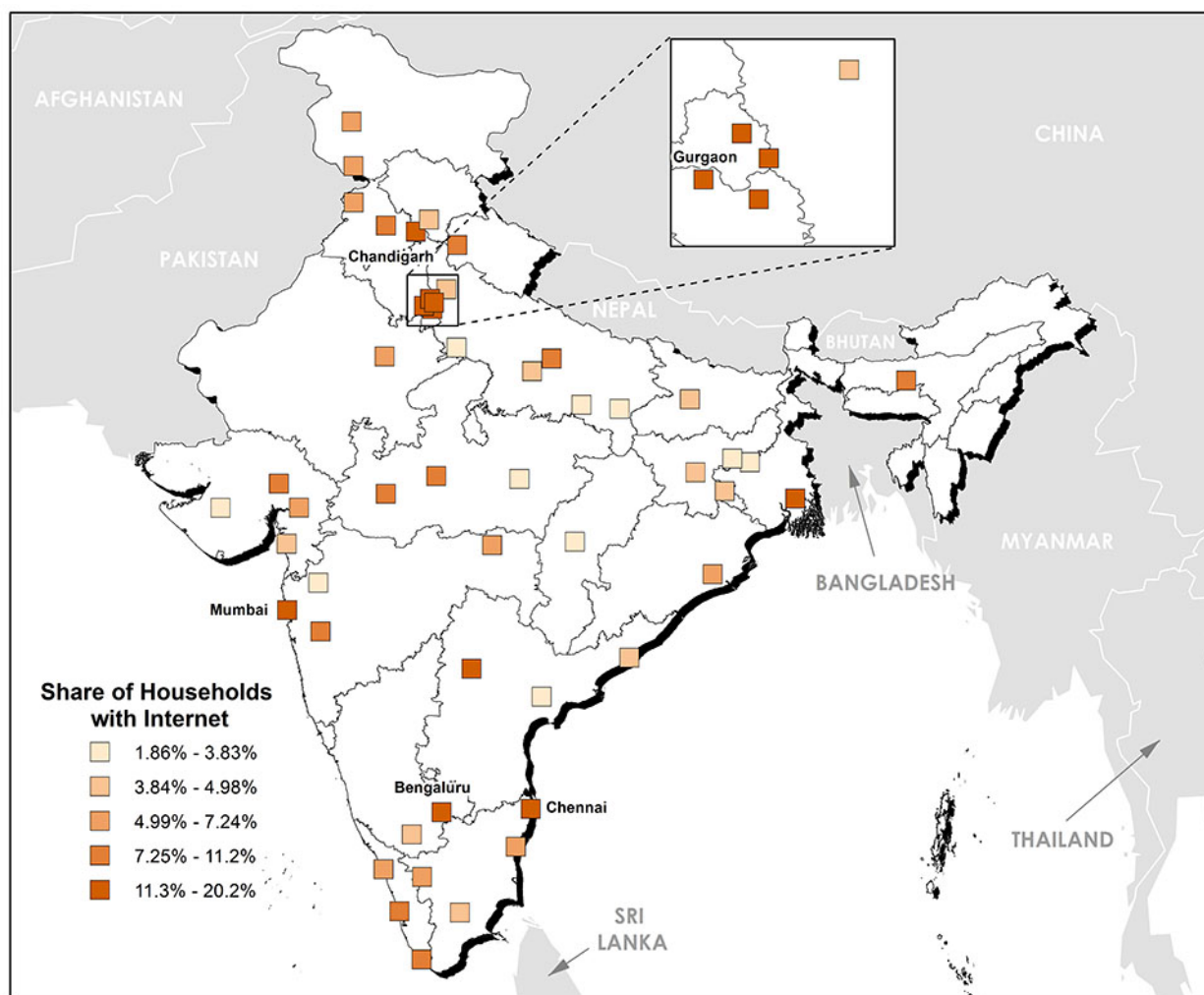
The low level of tech connectivity is reflected by a relative low level of households with computer/laptop using internet (**Exhibit 26**). The top five ranked cities, three of the six major cities Mumbai, Chennai and Bengaluru, Chandigarh, and Gurgaon near Delhi have household shares with computer/laptop using internet between 18 and 20 percent. The cities ranked 5th to 12th, the other three major cities Hyderabad, Delhi, Kolkata, Faridabad and Noida near Delhi, Kochi in Kerala and Pune in Maharashtra have household shares with computer/laptop using internet between 10 and 17 percent.

Exhibit 27

Share of Households with mobile phones
- ☐ 34.1% - 50.2%
- ☐ 50.3% - 57.5%
- ☐ 57.6% - 60.6%
- ☐ 60.7% - 65.1%
- ☐ 65.2% - 74.1%
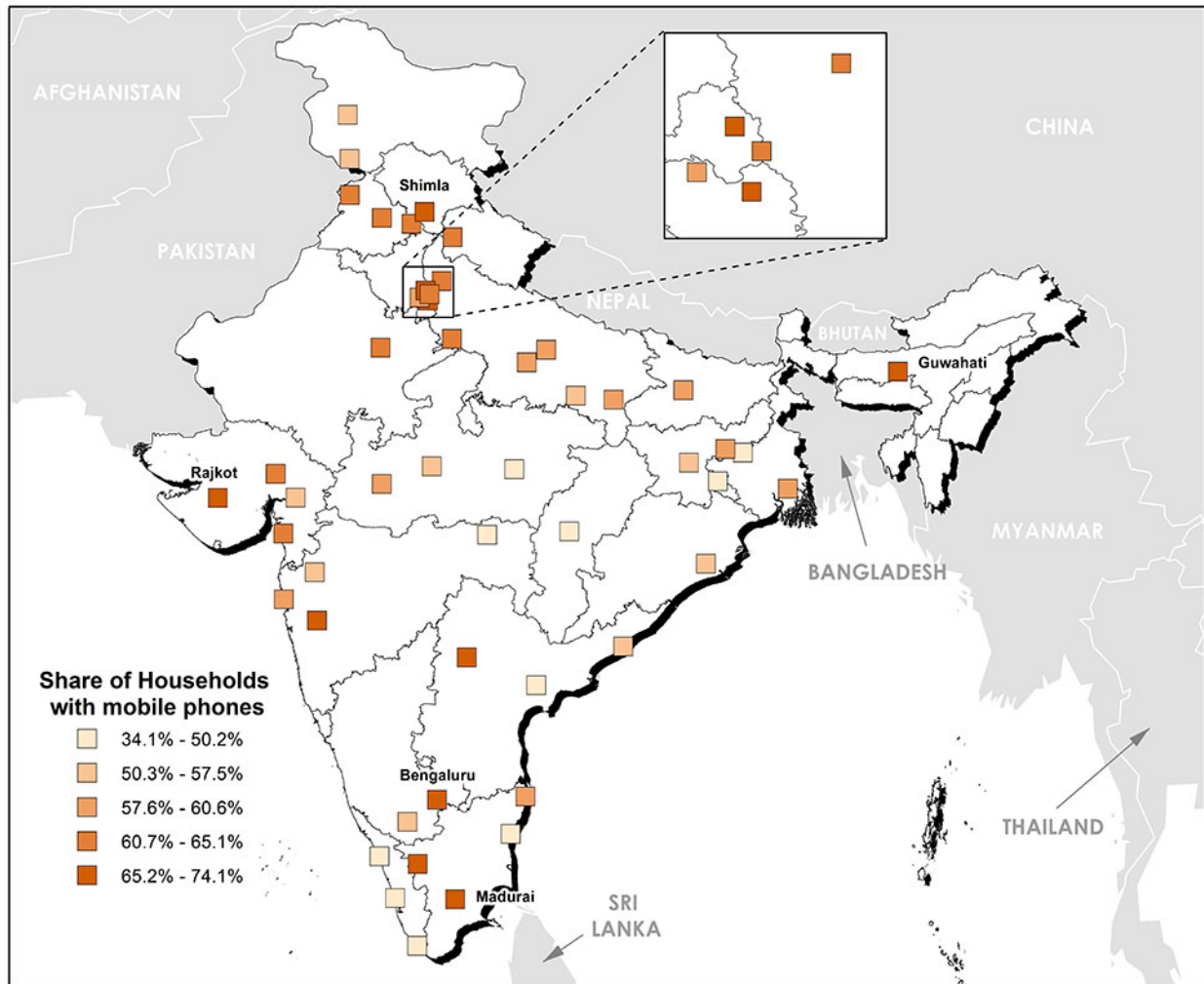
However, Tech Access measured by the share of households with mobile phones (**Exhibit 27**) shows that access to mobile phones in India's cities is more common. Overall, the share of households with mobile phones ranges between 34 percent and 74 percent. Except for Kozhikode in Kerala, Jabalpur in Madhya Pradesh and Raipur in Chhattisgarh all other cities reveal at least a share of 50 percent of households with mobile phones.
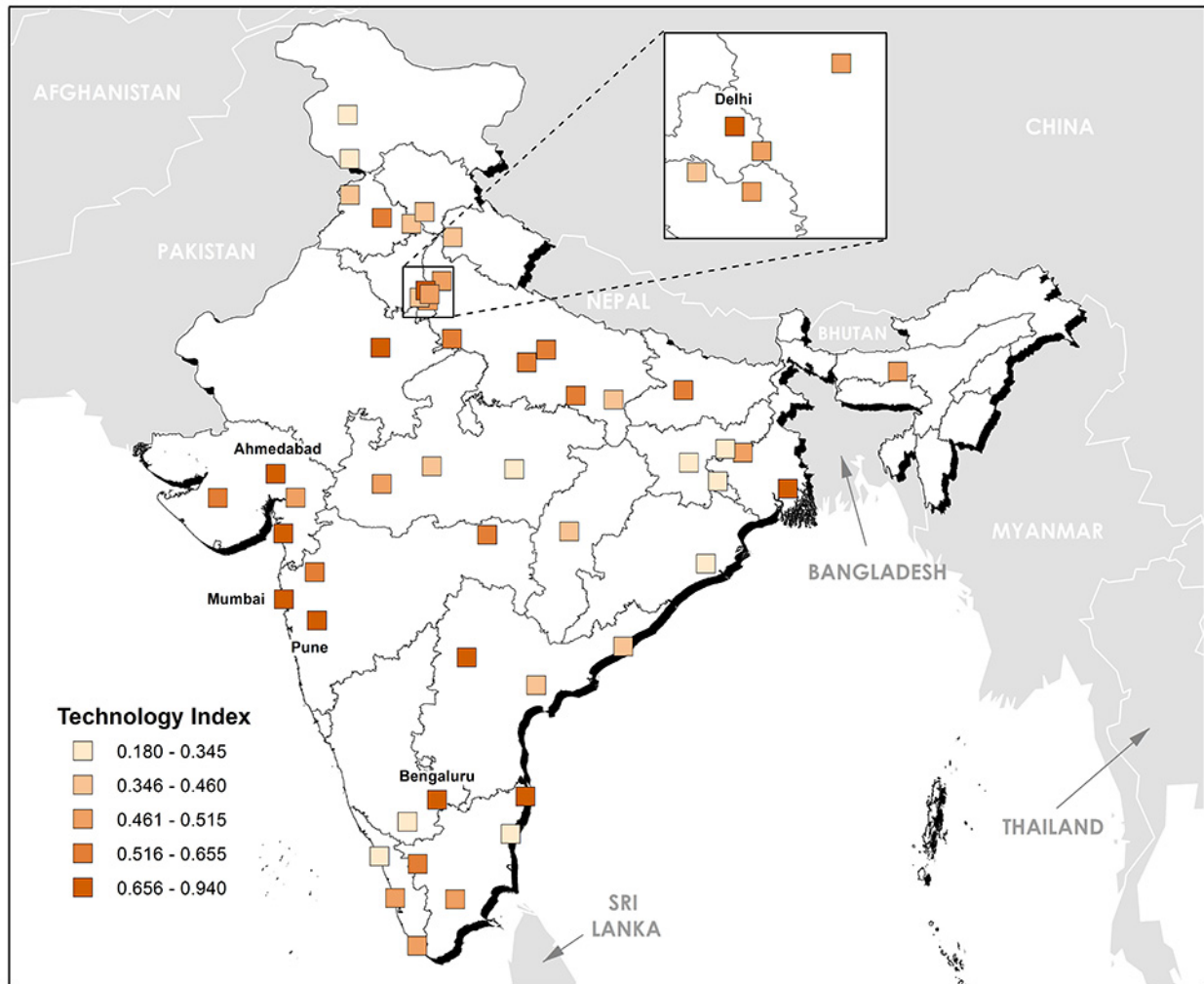
Overall, the combination of Tech Connectivity and Tech Access makes up the overall Tech Index of the 50 cities (**Exhibit 28**). A score closer to 1 signals a higher level of technological development whereas a lower score refer to less advanced technological development. Here, the Tech Index ranges between 0.94 and 0.18. The six major cities all rank within the top 10 with scores above 0.68. Bengaluru (0.94) and Delhi (0.93) rank first and second followed by Pune (0.89) ranking third. The ranking of the Tech Index seems to reflect the classification of Tier-I, Tier-II and Tier-III cities mentioned in the scope of the report.

The Tech Index for India's 50 most competitive cities refines the previous results of the Tech Index for India's State and Territories which revealed that the Tech Index scores appeared highest in regions with large urban centres and relatively high in regions with international connections either through trade or tourism.

Tech Start-Ups in India — The Success of redBus

The story of the redBus, India's largest online bus ticket platform, reveals how innovation can facilitate growth and prosperity by addressing a regional market need. Phanindra Sama, a graduate from Birla Institute of Technology & Science, Pilani, one of India's most prestigious higher education institutes, envisioned the idea for redBus in 2005 when he was unable to travel from Bengaluru home to Hyderabad during Diwali season due to a lack of available bus tickets. Back then the only way to purchase a bus ticket was in person from a travel agent representing a number of bus operators. Together with Charan Padmaraju, Sama created redBus, which is an online service that allows customers to purchase bus tickets across numerous operators, along with other services such as selection of seats and return tickets. The business grew quickly as the idea of redBus responded to a market need, leading to ticket sales of over one million a month, and an employment of over 600 people. In 2012, the business magazine Fast Company ranked redBus 48th among the world's 50 most innovative companies, a list that is lead by global household names such as Apple, Goggle and Facebook. The only other Indian company on the list ranking 36th is Narayana Hrudayalaya, one of India's largest multi-specialty hospital chains (Fast Company, 2013). Recently the founders of redBus sold their shares in the company to the Ibibo Group, specializing in e-commerce and online transactions in India and a subsidiary of Naspers, a multinational mass media company based in Cape Town, South Africa. To date this exit deal is the largest overseas acquisition of an Indian tech company which may encourage new start-ups and foster competition in the market. The innovative idea of redBus shows how tech entrepreneurs can create a scalable business and solid brand with limited initial funds by providing a new service that the Indian market can afford and support.

Adapted from Sharma, S. and S. John, "redBus Sold to Ibibo in One of the Biggest Overseas Internet Deals", *The Times of India*, June 21, 2013.
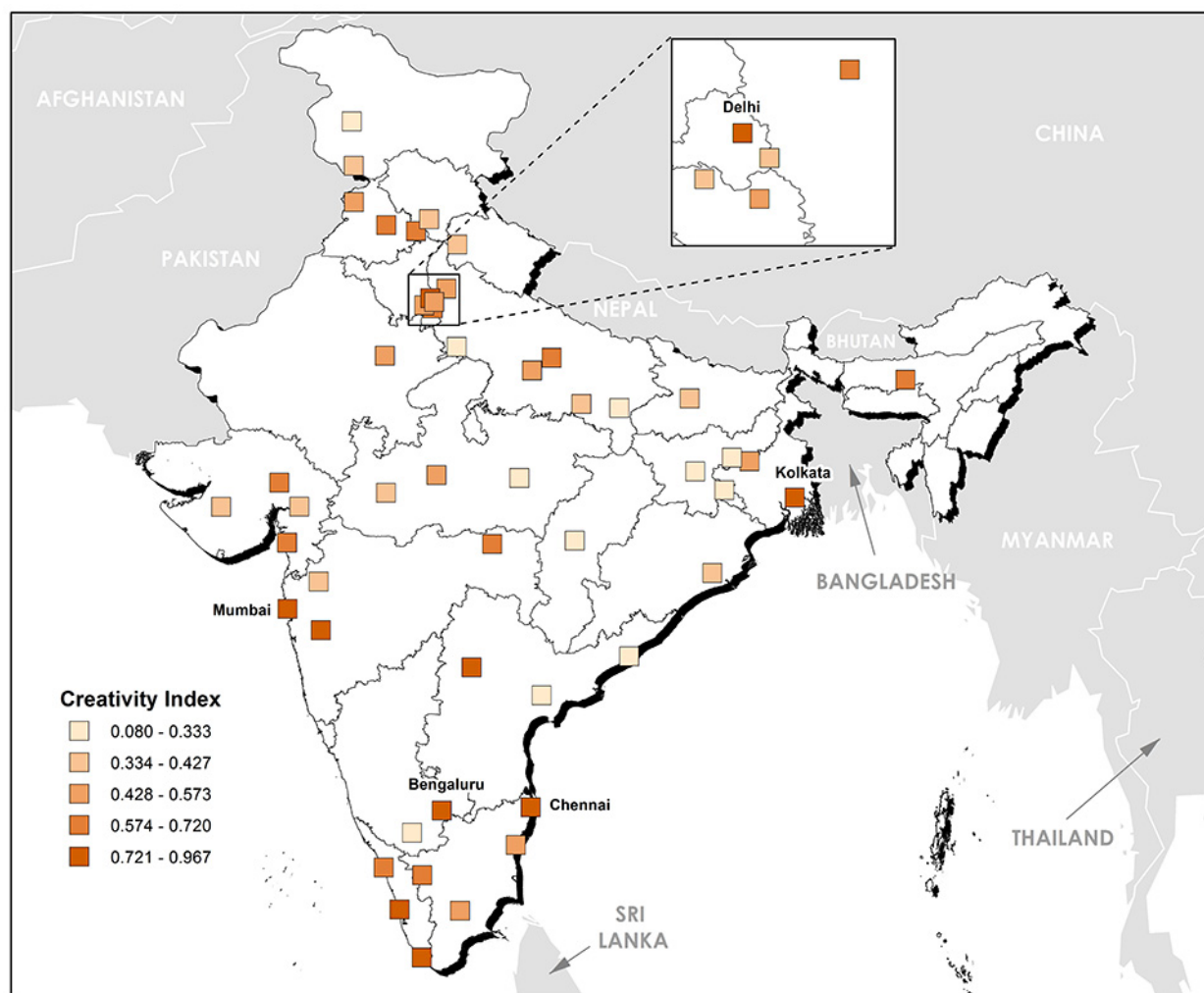
Exhibit 29

Creativity Index

The combination of the 3Ts, Tolerance, Talent and Technology Indices, makes up the overall Creativity Index of India's cities (**Exhibit 29**). Not surprisingly, the regional patterns that emerged within each of the individual T analysis are more pronounced in the overall Creativity Index.

The Creativity Index ranges between 0.97 and 0.08. 23 cities out of the 50 cities show indices above average. The ranking is lead by India's six major cities with indices between 0.87 and 0.97 followed by Thiruvananthapuram in Kerala ranking 7th, Pune in Maharashtra ranking 8th and Kochi in Kerala ranking 9th with slightly lower indices between 0.73 and 0.77. All Tier-I cities show above average creativity indices except for Noida in Uttar Pradesh which ranks with an index of 0.49 just below average. Among the 50 cities five cities rank with scores below 0.2 on the Creativity Index; these cities are Mysore in Karnataka, Jabalpur in Madhya Pradsesh, Raipur in Chhat-tisgarh, andDhanbad and Jamshedpur in Jharkland.

Overall, the Creativity Index reflects India's urbanization and recent shifts towards a creative and knowledge economy as well as the role of the quality of place and proves two correlations. First, the 3Ts ranking reveals a correlation between scale and performance expressed by the six major cities which pre-dominately rank highest in most of the indi-vidual rankings of the 3Ts analysis. Second, smaller cities which historically were governed with emphasis on, for example, education poli-cies scored higher than other cities without this historical advantage as expressed by the cities in Kerala.

8 CONCLUSION

This report analyzes the creative economy assets of the 50 most competitive Indian cities. By applying the innovative framework of Creative Capital theory the analysis explores the presence of the so-called 3Ts, referred to as Tolerance, Talent and Technology, in each of these 50 cities and compares them to each other. The results of the 3T analysis are then combined to build the overall Creativity Index of the 50 cities.

The analysis of Tolerance includes three proxy measures due to a lack of data on visible minorities and LGBT at the urban level. The proxy measures consist of a Religious Diversity Index, population density, and female to male literacy ratio which are combined to build the Tolerance Index of the 50 cities. The six major cities, Bengaluru, Chennai, Delhi, Hyderabad, Mumbai and Kolkata, Thiruvananthapuram and Kozhikode in Kerala, Guwahati in Assam, and Chandigarh make up the Top 10 Indian cities on the Tolerance Index, followed by Kochi in Kerala ranking 11th.

The analysis of Talent includes five measures, Creative Class share, and a proxy of four measures making up for the lack of data on the share of population over the age of 25 with a bachelor degree of higher at the urban level. The proxy for degree share consists of pupil to teacher ratio higher than 35 at Upper Primary Level, male literacy rate, female literacy rate, and the number of engineering and MBA schools. In combination these measures build the Talent Index of the 50 cities. Kochi in Kerala ranks 1st closely followed by Mumbai ranking 2nd and Thiruvananthapuram in Kerala ranking 3rd. The other major cities, with the exception of Hyderabad which only ranks 13th, Pune in Maharashtra, Kozhikode in Kerala and Chandigarh complete the top 10 of the 50 cities.

The analysis of Technology includes only two measures, Tech Connectivity and Tech Access, due to a lack of data on Tech Education at the urban level. Tech Connectivity is measured by the number of wireless broadband connections per 100,000 and the increase in the number of wireless subscribers per 100,000, and Tech Access is measured by the share of households using a computer or laptop to use the internet and the share of households with mobile phones. Taken together these measures build the Tech Index. The six major cities, as well as Pune in

Maharashtra, Ahmedabad and Surat in Gujarat, and Jaipur in Rajasthan, rank in the top 10 of the 50 cities.

The overall Creativity Index, which combines the individual 3Ts, Tolerance, Talent and Technology, and reflects the regional patterns that emerge within each of the individual T analysis. The ranking is lead by India's six major cities followed by Thiruvananthapuram in Kerala ranking 7th, Pune in Maharashtra ranking 8th and Kochi in Kerala ranking 9th.

The 3Ts analysis reveals two prevailing and interrelated correlations, first, between scale and performance expressed by major cities ranking predominately very high, and second, between quality of place and performance expressed by the cities from Kerala known for progressive education policies. These results confirm the general assumptions underlying Creative Capital theory, that, first, urbanization refers to larger and economically more prosperous populations, emphasized as economies of scale and agglomeration effects, and that second, competitiveness, economic growth and prosperity depend more so on productivity, technology and human capital or skill, emphasized as quality of place.

However, although cities have become key to business economic competitiveness and prosperity of people and societies, urbanization and the transition from an agricultural and industrial economy to a creativity- and service-based post-industrial economy are accompanied by growing social, environmental and governance challenges. Contradicting realities of opportunities and hope, inequality and exclusion, politics and power increasingly exist closely intertwined in the same place.

Yet places compete with each other. Growing, retaining and attracting talent, building technology and promoting tolerance accompanied by broader infrastructural improvements and more efficient governance foster competitiveness and increases prosperity. Currently, India's cities compete both more regionally within the country and beyond the country's borders in Asia rather than globally. In international comparison India's major cities are acknowledged but currently rank only moderately or low in terms of international competitiveness and prosperity.

Still, both scale and quality of place are closely intertwined. It is projected that 70 percent of the global population may live in cities by mid 21st century. Although India has only been urbanizing slowly with still two-thirds of its total population living in rural areas it is expected that 50 percent of India's total population or 850 million Indian people may live in cities by 2050 — an enormous potential for competitiveness and prosperity. The major challenge is to balance expansion, access to opportunities or equity, and quality.

The report is part of an evolving research stream about the creative economy in India. It follows up on an initial report that focused on the creative economy of India's States and Union Territories (Martin Prosperity Institute, 2013) and precedes a third report that will aim to carry out an in-depth analysis of the 3Ts and territorial assets for selected Indian cities. However, the 3Ts analysis is currently impeded by a lack of data for specific variables at the urban level such as occupations or share of higher education degrees. Thus, each

analysis can only be *jugaad*; it could be better and more accurate but it is good enough to reveal certain trends. Hence, taken together the reports on India's creative economy are intended to facilitate the discussion about competitiveness and prosperity in light of the potentials and constraints of India's urbanization and the country's economic transition from an agricultural and industrial economy to a creativity- and service-based post-industrial growing economy during the 21st century.

Appendices

APPENDICES

Varying Definitions of "Urban"

Brazil:
Urban and suburban zones of administrative centres of municipalities and districts.

Russian Federation:
Cities and urban-type localities, officially designated as such, usually according to the criteria of number of inhabitants and predominance of agricultural, or number of non-agricultural workers and their families.

India:
Towns (places with municipal corporation, municipal area committee, town committee, notified area committee or cantonment board); also, all places having 5,000 or more inhabitants, a density of not less than 1,000 persons per square mile or 400 per square kilometre, pronounced urban characteristics and at least three fourths of the adult male population employed in pursuits other than agriculture.

China:
Cities only refer to the cities proper of those designated by the State Council. In the case of cities with district establishment, the city proper refers to the whole administrative area of the district if its population density is 1,500 people per kilometre or higher; or the seat of the district government and other areas of streets under the administration of the district if the population density is less than 1,500 people per kilometre. In the case of cities without district establishment, the city proper refers to the seat of the city government and other areas of streets under the administration of the city. For the city district with the population density below 1,500 people per kilometre and the city without district establishment, if the urban construction of the district or city government seat has extended to some part of the neighboring designated town(s) or township(s), the city proper does include the whole administrative area of the town(s) or township(s).

South Africa:
Places with some form of local authority.

Canada:
Places of 1,000 or more inhabitants, having a population density of 400 or more per square kilometre.

United States:
Agglomerations of 2,500 or more inhabitants, generally having population densities of 1,000 persons per square mile or more. Two types of urban areas: urbanized areas of 50,000 or more inhabitants and urban clusters of at least 2,500 and less than 50,000 inhabitants.

Source: UN Demographic Yearbook 2005, table 6

City	Total Population Cities	City	Total Population Cities
Delhi	16,753,235	Kozhikode	3,089,543
Mumbai	12,478,447	Madurai	3,041,038
Bengaluru	9,588,910	Mysore	2,994,744
Pune	9,426,959	Ranchi	2,912,022
Asansol	7,723,663	Dhanbad	2,682,662
Ahmedabad	7,208,200	Amritsar	2,490,891
Jaipur	6,663,971	Jabalpur	2,460,714
Nashik	6,109,052	Bhopal	2,368,145
Surat	6,079,231	Jamshedpur	2,291,032
Allahabad	5,959,798	Bhubaneswar	2,246,341
Patna	5,772,804	Faridabad	1,798,954
Chennai	4,681,087	Dehradun	1,698,560
Nagpur	4,653,171	Noida	1,674,714
Lucknow	4,588,455	Jammu	1,526,406
Kanpur	4,572,951	Gurgaon	1,514,085
Vijayawada	4,529,009	Srinagar	1,269,751
Kolkata	4,486,679	Guwahati	1,260,419
Agra	4,380,793	Puducherry	1,244,464
Vishakhapatnam	4,288,113	Chandigarh	1,054,686
Vadodara	4,157,568	Shimla	813,384
Raipur	4,062,160		
Hyderabad	4,010,238		
Rajkot	3,799,770		
Varanasi	3,682,194		
Ludhiana	3,487,882		
Coimbatore	3,472,578		
Meerut	3,447,405		
Thiruvananthapuram	3,307,284		
Kochi	3,279,860		
Indore	3,272,335		

City	Urban Population	City	Urban Population
Delhi	16,333,916	Varanasi	1,599,260
Mumbai	9,332,481	Dhanbad	1,559,416
Bengaluru	8,719,939	Raipur	1,482,227
Ahmedabad	6,058,764	Allahabad	1,476,610
Pune	5,739,716	Jabalpur	1,438,777
Asansol	5,169,079	Faridabad	1,429,093
Surat	4,843,722	Amritsar	1,336,060
Jaipur	3,499,204	Jamshedpur	1,272,680
Nagpur	3,178,194	Ranchi	1,257,340
Lucknow	3,037,718	Mysore	1,238,332
Kanpur	3,015,129	Bhubaneswar	1,080,721
Chennai	2,808,652	Guwahati	1,044,832
Hyderabad	2,807,167	Gurgaon	1,042,000
Coimbatore	2,633,170	Chandigarh	1,025,682
Nashik	2,598,167	Noida	997,410
Patna	2,510,093	Dehradun	949,560
Indore	2,424,312	Puducherry	850,123
Kochi	2,232,564	Jammu	610,562
Rajkot	2,208,582	Srinagar	507,900
Kozhikode	2,074,778	Shimla	201,500
Ludhiana	2,062,681		
Vadodara	2,059,777		
Vishakhapatnam	2,037,458		
Kolkata	2,019,006		
Agra	2,009,497		
Bhopal	1,914,339		
Vijayawada	1,857,291		
Madurai	1,844,209		
Thiruvananthapuram	1,779,254		
Meerut	1,762,573		

City	Rural Population	City	Rural Population
Allahabad	4,483,188	Dhanbad	1,123,246
Pune	3,687,243	Kochi	1,047,296
Nashik	3,510,885	Jabalpur	1,021,937
Patna	3,262,711	Jamshedpur	1,018,352
Jaipur	3,164,767	Kozhikode	1,014,765
Mumbai	3,145,966	Jammu	915,844
Vijayawada	2,671,718	Bengaluru	868,971
Raipur	2,579,933	Indore	848,023
Asansol	2,554,584	Coimbatore	839,408
Kolkata	2,467,673	Srinagar	761,851
Agra	2,371,296	Dehradun	749,000
Vishakhapatnam	2,250,655	Noida	677,304
Vadodara	2,097,791	Shimla	611,884
Varanasi	2,082,934	Gurgaon	472,085
Chennai	1,872,435	Bhopal	453,806
Mysore	1,756,412	Delhi	419,319
Meerut	1,684,832	Puducherry	394,341
Ranchi	1,654,682	Faridabad	369,861
Rajkot	1,591,188	Guwahati	215,587
Kanpur	1,557,822	Chandigarh	29,004
Lucknow	1,550,737		
Thiruvananthapuram	1,528,030		
Nagpur	1,474,977		
Ludhiana	1,425,201		
Surat	1,235,509		
Hyderabad	1,203,071		
Madurai	1,196,829		
Bhubaneswar	1,165,620		
Amritsar	1,154,831		
Ahmedabad	1,149,436		

City	Percentage decadal growth rate (2001–2011)	City	Percentage decadal growth rate (2001–2011)
Gurgaon	73.93	Jamshedpur	15.53
Noida	51.52	Amritsar	15.48
Bengaluru	46.68	Ludhiana	15.00
Surat	42.19	Jabalpur	14.40
Raipur	34.65	Nagpur	14.39
Indore	32.70	Vadodara	14.16
Dehradun	32.48	Mysore	13.39
Faridabad	31.75	Shimla	12.58
Pune	30.34	Jammu	12.48
Bhopal	28.50	Asansol	12.01
Puducherry	27.72	Dhanbad	11.91
Jaipur	26.91	Vishakhapatnam	11.89
Lucknow	25.79	Kanpur	9.72
Ranchi	23.90	Vijayawada	8.15
Srinagar	23.56	Mumbai	8.01
Patna	22.34	Chennai	7.77
Nashik	22.33	Kozhikode	7.31
Ahmedabad	22.31	Kochi	5.60
Agra	20.96	Hyderabad	4.71
Delhi	20.96	Thiruvananthapuram	2.25
Allahabad	20.71	Kolkata	-1.88
Rajkot	19.87		
Bhubaneswar	19.65		
Guwahati	18.95		
Coimbatore	18.46		
Madurai	17.95		
Varanasi	17.32		
Chandigarh	17.10		
Meerut	15.92		

City	Sex ratio
Kozhikode	1,097
Thiruvananthapuram	1,088
Puducherry	1,038
Kochi	1,028
Vishakhapatnam	1,003
Coimbatore	1,001
Vijayawada	997
Madurai	990
Chennai	986
Raipur	983
Mysore	982
Ranchi	950
Jamshedpur	949
Nagpur	948
Hyderabad	943
Vadodara	934
Nashik	931
Bhubaneswar	925
Jabalpur	925
Indore	924
Rajkot	924
Guwahati	922
Shimla	916
Bhopal	911
Pune	910
Jaipur	909
Varanasi	909
Bengaluru	908
Dhanbad	908

City	Sex ratio
Lucknow	906
Ahmedabad	903
Allahabad	902
Dehradun	902
Kolkata	899
Patna	892
Asansol	889
Meerut	885
Amritsar	884
Srinagar	879
Faridabad	871
Jammu	871
Ludhiana	869
Delhi	866
Agra	859
Mumbai	857
Gurgaon	853
Kanpur	852
Noida	852
Chandigarh	818
Surat	788

City	Religious Diversity Index	City	Religious Diversity Index
Ludhiana	0.598	Indore	0.252
Mumbai	0.552	Nashik	0.251
Hyderabad	0.533	Mysore	0.242
Kozhikode	0.516	Allahabad	0.242
Amritsar	0.490	Ahmedabad	0.238
Ranchi	0.479	Faridabad	0.236
Thiruvananthapuram	0.470	Vijayawada	0.222
Meerut	0.470	Madurai	0.211
Delhi	0.461	Jabalpur	0.207
Chandigarh	0.458	Jaipur	0.192
Guwahati	0.439	Jamshedpur	0.192
Kochi	0.419	Agra	0.192
Bhopal	0.407	Vadodara	0.187
Puducherry	0.406	Surat	0.180
Nagpur	0.398	Rajkot	0.176
Jammu	0.366	Patna	0.156
Kolkata	0.361	Raipur	0.108
Bengaluru	0.352	Srinagar	0.100
Lucknow	0.349	Vishakhapatnam	0.098
Asansol	0.338	Bhubaneswar	0.082
Gurgaon	0.329		
Chennai	0.320		
Coimbatore	0.314		
Kanpur	0.293		
Noida	0.283		
Dhanbad	0.280		
Varanasi	0.279		
Dehradun	0.273		
Pune	0.269		
Shimla	0.261		

City	Population density per square kilometre
Chennai	26,903
Kolkata	24,252
Mumbai	20,925
Hyderabad	18,480
Delhi	11,297
Chandigarh	9,252
Bengaluru	4,378
Puducherry	2,598
Varanasi	2,399
Faridabad	2,298
Guwahati	2,010
Lucknow	1,815
Patna	1,803
Thiruvananthapuram	1,509
Kanpur	1,449
Surat	1,376
Meerut	1,347
Kozhikode	1,318
Noida	1,306
Dhanbad	1,284
Gurgaon	1,241
Asansol	1,100
Allahabad	1,087
Agra	1,084
Kochi	1,069
Ludhiana	975
Amritsar	932
Ahmedabad	890
Bhopal	854
Indore	839

City	Population density per square kilometre
Madurai	823
Bhubaneswar	799
Coimbatore	748
Srinagar	703
Jamshedpur	648
Pune	603
Jaipur	598
Jammu	596
Ranchi	557
Vadodara	551
Dehradun	550
Vijayawada	519
Jabalpur	472
Nagpur	470
Mysore	437
Nashik	393
Vishakhapatnam	384
Rajkot	339
Raipur	310
Shimla	159

City	Female to male literacy ratio	City	Female to male literacy ratio
Kochi	0.970	Vadodara	0.849
Thiruvananthapuram	0.961	Mysore	0.849
Kozhikode	0.955	Rajkot	0.849
Kolkata	0.954	Jabalpur	0.845
Hyderabad	0.941	Asansol	0.845
Guwahati	0.940	Indore	0.840
Chennai	0.932	Faridabad	0.836
Bengaluru	0.924	Nashik	0.834
Mumbai	0.922	Srinagar	0.814
Nagpur	0.907	Noida	0.807
Ludhiana	0.906	Varanasi	0.801
Kanpur	0.904	Jamshedpur	0.797
Chandigarh	0.899	Ranchi	0.796
Amritsar	0.897	Vishakhapatnam	0.795
Surat	0.890	Patna	0.794
Delhi	0.889	Meerut	0.792
Bhubaneswar	0.887	Raipur	0.765
Madurai	0.887	Agra	0.755
Coimbatore	0.885	Dhanbad	0.755
Vijayawada	0.884	Jaipur	0.741
Puducherry	0.882	Allahabad	0.737
Dehradun	0.881		
Lucknow	0.877		
Bhopal	0.876		
Pune	0.875		
Ahmedabad	0.869		
Jammu	0.862		
Gurgaon	0.859		
Shimla	0.857		

City	Tolerance Index	City	Tolerance Index
Hyderabad	0.940	Pune	0.420
Mumbai	0.927	Dehradun	0.413
Kolkata	0.867	Dhanbad	0.393
Thiruvananthapuram	0.867	Indore	0.380
Kozhikode	0.853	Bhubaneswar	0.360
Guwahati	0.833	Vijayawada	0.360
Chandigarh	0.827	Patna	0.333
Delhi	0.820	Allahabad	0.307
Chennai	0.820	Shimla	0.293
Bengaluru	0.800	Mysore	0.293
Kochi	0.767	Vadodara	0.267
Ludhiana	0.767	Agra	0.267
Puducherry	0.733	Nashik	0.253
Amritsar	0.713	Jabalpur	0.253
Kanpur	0.680	Jamshedpur	0.240
Lucknow	0.660	Srinagar	0.220
Bhopal	0.580	Rajkot	0.187
Nagpur	0.560	Jaipur	0.180
Gurgaon	0.553	Vishakhapatnam	0.093
Meerut	0.553	Raipur	0.073
Coimbatore	0.520		
Surat	0.520		
Asansol	0.513		
Varanasi	0.513		
Jammu	0.480		
Faridabad	0.473		
Noida	0.467		
Madurai	0.440		
Ranchi	0.440		
Ahmedabad	0.427		

City	Creative Class share	City	Creative Class share
Jammu	40.0%	Mysore	11.3%
Srinagar	40.0%	Surat	11.0%
Chandigarh	36.9%	Rajkot	11.0%
Ludhiana	23.9%	Vadodara	11.0%
Amritsar	23.9%	Coimbatore	10.8%
Delhi	22.7%	Madurai	10.8%
Hyderabad	20.1%	Jaipur	10.2%
Pune	19.4%	Vijayawada	9.2%
Chennai	18.7%	Vishakhapatnam	9.2%
Ahmedabad	17.1%	Shimla	9.0%
Bengaluru	16.8%	Bhopal	8.4%
Mumbai	15.8%	Indore	8.4%
Faridabad	15.5%	Jabalpur	8.4%
Gurgaon	15.5%	Dehradun	7.9%
Thiruvananthapuram	14.4%	Nagpur	7.7%
Kochi	14.4%	Nashik	7.7%
Kozhikode	14.4%	Patna	4.1%
Asansol	13.9%	Bhubaneswar	3.9%
Guwahati	13.6%	Ranchi	3.4%
Kolkata	12.7%	Dhanbad	3.4%
Puducherry	12.3%	Jamshedpur	3.4%
Lucknow	11.9%	Raipur	3.4%
Kanpur	11.9%		
Noida	11.9%		
Meerut	11.9%		
Allahabad	11.9%		
Agra	11.9%		
Varanasi	11.9%		

City	Service Class share	City	Service Class share
Ahmedabad	42.55%	Surat	8.94%
Kolkata	39.40%	Rajkot	8.94%
Mumbai	39.05%	Vadodara	8.94%
Delhi	35.90%	Dehradun	7.55%
Bengaluru	31.20%	Jaipur	7.07%
Hyderabad	30.80%	Coimbatore	6.81%
Chandigarh	30.50%	Madurai	6.81%
Chennai	28.15%	Bhopal	6.65%
Pune	27.85%	Indore	6.65%
Ludhiana	16.90%	Jabalpur	6.65%
Amritsar	16.90%	Vijayawada	6.34%
Guwahati	16.67%	Vishakhapatnam	6.34%
Thiruvananthapuram	13.73%	Mysore	5.88%
Kochi	13.73%	Nagpur	5.40%
Kozhikode	13.73%	Nashik	5.40%
Shimla	13.67%	Bhubaneswar	4.89%
Faridabad	13.66%	Raipur	4.71%
Gurgaon	13.66%	Patna	4.40%
Puducherry	13.52%	Ranchi	3.75%
Lucknow	10.63%	Dhanbad	3.75%
Kanpur	10.63%	Jamshedpur	3.75%
Noida	10.63%		
Meerut	10.63%		
Allahabad	10.63%		
Agra	10.63%		
Varanasi	10.63%		
Asansol	10.45%		
Jammu	9.09%		
Srinagar	9.09%		

City	Working Class share	City	Working Class share
Chennai	53.20%	Vijayawada	11.90%
Jammu	52.73%	Vishakhapatnam	11.90%
Srinagar	52.73%	Lucknow	11.88%
Pune	52.70%	Kanpur	11.88%
Bengaluru	51.90%	Noida	11.88%
Hyderabad	49.00%	Meerut	11.88%
Kolkata	47.80%	Allahabad	11.88%
Mumbai	45.20%	Agra	11.88%
Delhi	41.50%	Varanasi	11.88%
Ahmedabad	40.60%	Nagpur	11.83%
Chandigarh	33.33%	Nashik	11.83%
Ludhiana	26.76%	Jaipur	9.53%
Amritsar	26.76%	Shimla	8.99%
Asansol	22.05%	Bhopal	8.87%
Coimbatore	21.36%	Indore	8.87%
Madurai	21.36%	Jabalpur	8.87%
Puducherry	18.96%	Guwahati	6.79%
Mysore	18.63%	Raipur	5.73%
Faridabad	18.01%	Bhubaneswar	4.89%
Gurgaon	18.01%	Dehradun	3.40%
Surat	16.40%	Patna	2.93%
Rajkot	16.40%	Ranchi	2.81%
Vadodara	16.40%	Dhanbad	2.81%
Thiruvananthapuram	13.73%	Jamshedpur	2.81%
Kochi	13.73%		
Kozhikode	13.73%		

City	Total number of MBA and engineering schools	City	Total number of MBA and engineering schools
Bengaluru	189	Madurai	10
Delhi	158	Vijayawada	10
Chennai	151	Ranchi	10
Mumbai	135	Vadodara	9
Pune	128	Rajkot	8
Hyderabad	111	Patna	8
Kolkata	102	Chandigarh	7
Jaipur	70	Mysore	7
Ahmedabad	46	Surat	6
Coimbatore	45	Guwahati	5
Bhopal	43	Ludhiana	4
Bhubaneswar	43	Puducherry	4
Gurgaon	42	Varanasi	4
Lucknow	42	Asansol	2
Indore	36	Jammu	2
Noida	35	Shimla	2
Nagpur	33	Srinagar	2
Meerut	28	Kozhikode	1
Vishakhapatnam	23	Amritsar	1
Faridabad	21	Dhanbad	1
Dehradun	20	Jamshedpur	1
Kochi	16		
Allahabad	16		
Raipur	16		
Kanpur	15		
Agra	13		
Thiruvananthapuram	12		
Nashik	12		
Jabalpur	11		

City	Pupil Teacher Ratio >35 at Upper Primary Level (in %)	City	Pupil Teacher Ratio >35 at Upper Primary Level (in %)
Puducherry	2.0	Coimbatore	35.0
Srinagar	2.3	Jabalpur	37.9
Kochi	2.7	Nashik	38.0
Shimla	2.7	Dehradun	38.3
Jammu	3.5	Bhubaneswar	41.4
Thiruvananthapuram	5.1	Jamshedpur	41.6
Kozhikode	6.7	Agra	41.7
Amritsar	6.8	Noida	41.9
Vijayawada	6.9	Ahmedabad	42.7
Faridabad	8.3	Surat	42.8
Guwahati	9.0	Chennai	45.8
Vishakhapatnam	9.1	Kanpur	46.7
Hyderabad	10.0	Varanasi	47.9
Kolkata	12.6	Indore	50.5
Chandigarh	13.7	Allahabad	60.8
Ludhiana	15.6	Ranchi	61.5
Jaipur	16.6	Lucknow	65.5
Asansol	18.3	Dhanbad	68.9
Mysore	19.6	Patna	84.6
Gurgaon	21.2		
Nagpur	22.4		
Rajkot	23.2		
Raipur	26.1		
Mumbai	26.5		
Bhopal	29.2		
Delhi	29.7		
Bengaluru	30.1		
Pune	30.3		
Vadodara	30.7		
Madurai	33.2		
Meerut	33.2		

City	Pupil Teacher Ratio >30 at Upper Primary Level (in %)	City	Pupil Teacher Ratio >30 at Upper Primary Level (in %)
Jammu	5.2	Faridabad	44.4
Shimla	5.4	Surat	45.5
Srinagar	5.5	Jabalpur	45.7
Puducherry	6.8	Meerut	46.6
Kochi	7.5	Dehradun	48.2
Kozhikode	8.0	Bhubaneswar	52.5
Thiruvananthapuram	14.2	Noida	53.7
Vishakhapatnam	16.8	Kanpur	56.8
Vijayawada	19.3	Mumbai	57.1
Mysore	19.9	Agra	57.7
Kolkata	20.3	Indore	58.2
Chandigarh	25.0	Gurgaon	58.5
Coimbatore	25.9	Ranchi	60.7
Pune	27.7	Ahmedabad	61.0
Madurai	27.7	Lucknow	63.5
Jaipur	28.5	Varanasi	64.7
Nagpur	28.9	Delhi	68.8
Guwahati	30.7	Dhanbad	69.8
Ludhiana	32.1	Allahabad	80.4
Vadodara	33.0	Patna	83.5
Amritsar	33.4		
Bengaluru	34.2		
Nashik	35.9		
Raipur	37.5		
Asansol	37.8		
Rajkot	38.6		
Bhopal	40.3		
Chennai	40.6		
Jamshedpur	41.7		
Hyderabad	42.9		

City	Literacy rate: Male		City	Literacy rate: Male
Kozhikode	97.6		Raipur	86.5
Kochi	97.1		Ludhiana	86.3
Thiruvananthapuram	94.6		Dhanbad	85.7
Mumbai	94.3		Ranchi	85.6
Nagpur	93.8		Varanasi	85.1
Chennai	93.5		Kanpur	85.1
Pune	92.7		Allahabad	85.0
Bhubaneswar	92.6		Jamshedpur	84.5
Ahmedabad	92.4		Lucknow	84.3
Puducherry	92.1		Asansol	83.4
Bengaluru	91.8		Hyderabad	83.4
Guwahati	91.3		Meerut	82.9
Surat	91.1		Amritsar	81.2
Delhi	91.0		Patna	80.3
Shimla	90.7		Vijayawada	79.1
Chandigarh	90.5		Mysore	78.4
Dehradun	90.3		Agra	78.3
Gurgaon	90.3		Srinagar	78.0
Noida	90.2		Vishakhapatnam	75.5
Faridabad	89.9			
Jammu	89.8			
Coimbatore	89.5			
Indore	89.2			
Jabalpur	89.1			
Kolkata	89.1			
Rajkot	88.7			
Nashik	88.0			
Vadodara	87.6			
Bhopal	87.4			
Jaipur	87.3			
Madurai	86.6			

City	Literacy rate: Female	City	Literacy rate: Female
Kochi	94.3	Vadodara	74.4
Kozhikode	93.2	Lucknow	73.9
Thiruvananthapuram	90.9	Nashik	73.4
Chennai	87.2	Amritsar	72.8
Mumbai	86.9	Noida	72.8
Guwahati	85.8	Asansol	70.5
Nagpur	85.1	Vijayawada	69.9
Kolkata	85.0	Ranchi	68.2
Bengaluru	84.8	Varanasi	68.2
Bhubaneswar	82.1	Jamshedpur	67.3
Chandigarh	81.4	Mysore	66.6
Puducherry	81.2	Raipur	66.2
Pune	81.1	Meerut	65.7
Surat	81.0	Dhanbad	64.7
Delhi	80.9	Jaipur	64.6
Ahmedabad	80.3	Patna	63.7
Dehradun	79.6	Srinagar	63.5
Coimbatore	79.2	Allahabad	62.7
Hyderabad	78.4	Vishakhapatnam	60.0
Ludhiana	78.2	Agra	59.2
Shimla	77.8		
Gurgaon	77.6		
Jammu	77.4		
Kanpur	76.9		
Madurai	76.7		
Bhopal	76.6		
Jabalpur	75.3		
Rajkot	75.3		
Faridabad	75.2		
Indore	74.9		

City	Talent Index	City	Talent Index
Kochi	0.828	Madurai	0.408
Mumbai	0.824	Vadodara	0.408
Thiruvananthapuram	0.792	Indore	0.404
Bengaluru	0.784	Jabalpur	0.404
Pune	0.776	Kanpur	0.392
Delhi	0.768	Asansol	0.384
Chennai	0.764	Vijayawada	0.376
Kolkata	0.724	Lucknow	0.372
Kozhikode	0.712	Meerut	0.368
Chandigarh	0.692	Nashik	0.356
Ahmedabad	0.684	Vishakhapatnam	0.352
Puducherry	0.676	Raipur	0.336
Hyderabad	0.672	Mysore	0.328
Guwahati	0.672	Allahabad	0.284
Gurgaon	0.668	Varanasi	0.264
Faridabad	0.648	Agra	0.260
Nagpur	0.644	Ranchi	0.212
Jammu	0.632	Jamshedpur	0.160
Bhubaneswar	0.572	Patna	0.136
Coimbatore	0.560	Dhanbad	0.116
Ludhiana	0.556		
Shimla	0.524		
Dehradun	0.492		
Bhopal	0.488		
Jaipur	0.480		
Noida	0.472		
Surat	0.468		
Amritsar	0.456		
Rajkot	0.448		
Srinagar	0.436		

City	No. of wireless broadband connections per 100,000	City	No. of wireless broadband connections per 100,000
Delhi	63.66	Kozhikode	11.74
Mumbai	47.42	Madurai	11.56
Bengaluru	36.44	Mysore	11.38
Pune	35.82	Ranchi	11.07
Asansol	29.35	Dhanbad	10.19
Ahmedabad	27.39	Amritsar	9.47
Jaipur	25.32	Jabalpur	9.35
Nashik	23.21	Bhopal	9.00
Surat	23.10	Jamshedpur	8.71
Allahabad	22.65	Bhubaneswar	8.54
Patna	21.94	Faridabad	6.84
Chennai	17.79	Dehradun	6.45
Nagpur	17.68	Noida	6.36
Lucknow	17.44	Jammu	5.80
Kanpur	17.38	Gurgaon	5.75
Vijayawada	17.21	Srinagar	4.83
Kolkata	17.05	Guwahati	4.79
Agra	16.65	Puducherry	4.73
Vishakhapatnam	16.29	Chandigarh	4.01
Vadodara	15.80	Shimla	1.87
Raipur	15.44		
Hyderabad	15.24		
Rajkot	14.44		
Varanasi	13.99		
Ludhiana	13.25		
Coimbatore	13.20		
Meerut	13.10		
Thiruvananthapuram	12.57		
Kochi	12.46		
Indore	12.43		

City	Increase in the no. of wireless subscribers per 100,000	City	Increase in the no. of wireless subscribers per 100,000
Delhi	60.36	Coimbatore	12.46
Mumbai	44.96	Ranchi	11.72
Bengaluru	34.40	Madurai	10.91
Pune	33.81	Dhanbad	10.80
Asansol	32.60	Mysore	10.74
Jaipur	28.13	Amritsar	10.51
Ahmedabad	25.86	Jabalpur	10.39
Allahabad	25.16	Bhopal	10.00
Patna	23.24	Jamshedpur	9.22
Nashik	21.91	Bhubaneswar	9.04
Surat	21.81	Faridabad	7.59
Lucknow	19.37	Dehradun	7.17
Kanpur	19.30	Noida	7.07
Agra	18.49	Gurgaon	6.39
Raipur	17.15	Jammu	6.15
Chennai	16.87	Srinagar	5.11
Nagpur	16.69	Guwahati	5.07
Vijayawada	16.25	Puducherry	4.46
Kolkata	16.17	Chandigarh	4.45
Varanasi	15.54	Shimla	3.27
Vishakhapatnam	15.38		
Vadodara	14.91		
Ludhiana	14.72		
Meerut	14.55		
Hyderabad	14.38		
Thiruvananthapuram	13.96		
Kochi	13.84		
Indore	13.81		
Rajkot	13.63		
Kozhikode	13.04		

City	Share of households with mobile phones	City	Share of households with mobile phones
Guwahati	74.1%	Mysore	57.5%
Rajkot	71.0%	Jammu	56.8%
Shimla	68.4%	Bhopal	56.3%
Madurai	68.2%	Bhubaneswar	55.0%
Bengaluru	68.1%	Allahabad	54.6%
Pune	67.6%	Nashik	54.2%
Hyderabad	67.4%	Vadodara	52.4%
Coimbatore	67.0%	Vishakhapatnam	52.1%
Faridabad	66.6%	Ranchi	51.5%
Delhi	66.4%	Srinagar	50.7%
Jaipur	65.1%	Nagpur	50.2%
Noida	65.0%	Puducherry	50.1%
Surat	64.9%	Thiruvananthapuram	49.1%
Amritsar	64.4%	Kochi	48.9%
Meerut	63.7%	Vijayawada	48.3%
Dehradun	62.2%	Jamshedpur	47.9%
Agra	61.5%	Asansol	46.7%
Chandigarh	61.2%	Kozhikode	43.1%
Ahmedabad	60.9%	Jabalpur	42.2%
Ludhiana	60.8%	Raipur	34.1%
Mumbai	60.6%		
Gurgaon	60.6%		
Kolkata	59.4%		
Chennai	59.2%		
Dhanbad	59.1%		
Indore	58.3%		
Varanasi	58.2%		
Patna	58.0%		
Lucknow	57.8%		
Kanpur	57.7%		

City	Share of households with computer/laptop using Internet	City	Share of households with computer/laptop using Internet
Gurgaon	20.20%	Shimla	4.98%
Mumbai	18.99%	Jamshedpur	4.61%
Chennai	18.67%	Madurai	4.38%
Chandigarh	18.27%	Surat	4.22%
Bengaluru	18.22%	Vishakhapatnam	4.22%
Hyderabad	17.20%	Mysore	4.12%
Delhi	17.15%	Patna	4.00%
Noida	15.72%	Ranchi	3.95%
Kolkata	12.85%	Meerut	3.95%
Faridabad	12.03%	Kanpur	3.88%
Kochi	11.23%	Jabalpur	3.83%
Pune	10.95%	Nashik	3.66%
Guwahati	9.88%	Agra	3.65%
Thiruvananthapuram	8.78%	Varanasi	3.15%
Ahmedabad	8.33%	Rajkot	2.77%
Ludhiana	8.21%	Vijayawada	2.46%
Bhopal	8.15%	Allahabad	2.37%
Lucknow	7.83%	Raipur	2.34%
Indore	7.42%	Dhanbad	2.25%
Dehradun	7.40%	Asansol	1.86%
Bhubaneswar	7.24%		
Srinagar	6.90%		
Coimbatore	6.67%		
Jammu	6.29%		
Jaipur	6.23%		
Amritsar	6.14%		
Vadodara	6.07%		
Nagpur	5.62%		
Kozhikode	5.39%		
Puducherry	5.17%		

City	Technology Index	City	Technology Index
Bengaluru	0.940	Gurgaon	0.460
Delhi	0.925	Amritsar	0.460
Pune	0.890	Vishakhapatnam	0.455
Mumbai	0.885	Varanasi	0.445
Ahmedabad	0.785	Chandigarh	0.420
Jaipur	0.775	Dehradun	0.420
Chennai	0.745	Vijayawada	0.395
Hyderabad	0.720	Bhopal	0.390
Surat	0.685	Shimla	0.350
Kolkata	0.680	Raipur	0.350
Lucknow	0.655	Bhubaneswar	0.345
Ludhiana	0.600	Mysore	0.345
Patna	0.595	Kozhikode	0.330
Coimbatore	0.580	Ranchi	0.305
Agra	0.560	Dhanbad	0.305
Nashik	0.540	Jammu	0.295
Kanpur	0.530	Srinagar	0.250
Nagpur	0.525	Jamshedpur	0.240
Rajkot	0.525	Jabalpur	0.200
Allahabad	0.520	Puducherry	0.180
Faridabad	0.515		
Madurai	0.510		
Indore	0.505		
Meerut	0.495		
Noida	0.490		
Vadodara	0.490		
Asansol	0.485		
Guwahati	0.480		
Thiruvananthapuram	0.465		
Kochi	0.465		

City	Creativity Index	City	Creativity Index
Mumbai	0.967	Jammu	0.427
Bengaluru	0.920	Indore	0.413
Delhi	0.907	Dehradun	0.413
Kolkata	0.873	Rajkot	0.387
Hyderabad	0.867	Bhubaneswar	0.373
Chennai	0.867	Patna	0.360
Thiruvananthapuram	0.773	Nashik	0.353
Pune	0.760	Vadodara	0.353
Kochi	0.733	Allahabad	0.340
Ludhiana	0.720	Shimla	0.340
Ahmedabad	0.713	Agra	0.333
Guwahati	0.700	Varanasi	0.333
Chandigarh	0.667	Vijayawada	0.287
Nagpur	0.660	Ranchi	0.213
Coimbatore	0.647	Vishakhapatnam	0.200
Kozhikode	0.640	Srinagar	0.200
Surat	0.633	Mysore	0.187
Faridabad	0.600	Jabalpur	0.173
Lucknow	0.587	Dhanbad	0.167
Gurgaon	0.573	Raipur	0.140
Kanpur	0.573	Jamshedpur	0.080
Amritsar	0.527		
Puducherry	0.520		
Jaipur	0.493		
Bhopal	0.493		
Noida	0.493		
Madurai	0.467		
Meerut	0.467		
Asansol	0.440		

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