Направление: «Градостроительство»

Профиль: «Управление пространственным развитием городов» **КОД - 040**

Время выполнения задания – 180 мин.

Выполните два задания (одно из Блока 1 на русском языке и одно из Блока 2 на английском языке).

Блок 1. Задания на русском языке

Выберите одно задание (тему эссе или описание кейса) из данного блока и напишите эссе или дайте аргументированные ответы на вопросы к кейсу. Ответ должен быть написан на русском языке. Максимальный балл за выполнение задания из данного блока – 50.

1. **Тема 1.1. Эффекты от ограничения использования личного автомобиля в городах с различными моделями пространственной организации.**

   Города M и N столкнулись с проблемами перегруженности улично-дорожной сети. Администрации городов приняли решение об ограничении использования личного автотранспорта путем увеличения его стоимости владения и использования при поездках в центр города.

   Город M – Моноцентричный город, где все рабочие места и места досуга расположены в едином центре города; горожане проживают преимущественно на селитебной территории между центром города и его границей. В городе M плата вводится на въезд на территорию центра города.
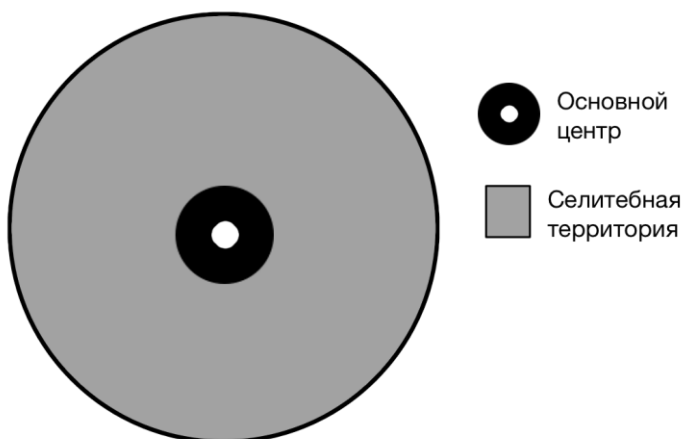
Моноцентричная модель пространственной организации города M

   Город N – Полицентричный город, где существует один основной центр и несколько субцентров – территорий концентрации рабочих мест и досуга; горожане проживают преимущественно на селитебной территории между центром, субцентрами и границей города. В городе N плата вводится на въезд на территорию основного центра города, но не на территории субцентров.

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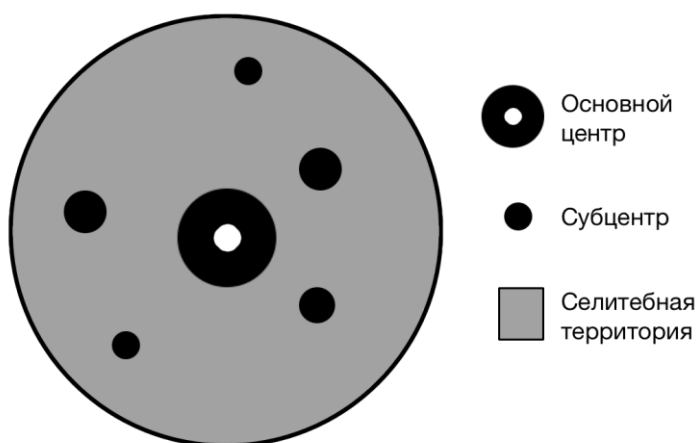
Полицентричная модель пространственной организации города N

Опишите, как принятые меры могут повлиять на:
- Структуру землепользования в городе;
- Рынок недвижимости;
- Размещение фирм, предприятий и мест приложения труда;
- Выбор места жительства горожанами;
- Пространственную структуру города.

Также опишите, каким образом эффекты от принятых мер будут отличаться в городах М и N с учетом соответствующих моделей их пространственной организации.

2. **Тема 1.2. Снос объектов (самовольного) строительства**

«Нельзя прикрываться бумажками о собственности, приобретенными явно жульническим путем. Вернем Москву москвичам. Ее скверы, площади, улицы. Открытые, красивые, любимые» – мэр Москвы С.С. Собянин

1 сентября 2015 года вступили в силу изменения в статье 222 Гражданского кодекса России, которые предоставили органам местного самоуправления (на территории города Москвы — Правительству Москвы) право принятия решения о сносе самовольных построек во внесудебном порядке. В декабре 2015 года московское правительство приняло решение о ликвидации 104 построек, возведенных без разрешения или с нарушением градостроительных норм.

Большинство объектов, вошедших в перечень сносимых самовольных построек, появилось в конце 1990-х — начале 2000-х годов. Разрешения и согласования изначально выдавались на размещение объектов некапитального строительства.

Впоследствии владельцы некапитальных торговых павильонов, киосков, лотков, палаток и прочего использовали разные способы переоформить право собственности на свои объекты как на капитальные. А затем пытались отстаивать свое право на собственность в суде.

В ночь с 8 на 9 февраля 2016 года в Москве единовременно начался снос 97 объектов самовольного строительства. Основная часть площадей павильонов находилась в аренде. Все объекты представляли собой коммерческие площади, где располагались объекты розничной торговли, сети кафе и ресторанов быстрого питания и различные предприятия малого бизнеса.

После произошедшего масштабного снова павильонов, мнение общественности и экспертов было представлено рядом позиций, которые можно коротко обозначить как:

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«в городе стало чисто и красиво», «павильоны предоставляли уникальные для каждого района коммерческие функции, которые после сноса будут в принципе недоступны для потребителя», «снос объектов нарушил имущественные права».

Ниже представлены иллюстрации по состоянию до и после сноса объектов.

Пример состояния до сноса объектов (м. Чистые пруды, центр города Москвы)

Пример состояния после сноса объектов (м. Чистые пруды, центр города Москвы)

Определите всех возможных стейкхолдеров данного кейса. Дайте комплексную оценку выгод и потерь, выявленных стейкхолдеров. Проанализируйте эффекты, оказываемые произошедшим, с точки зрения изменения качества городской среды, соблюдения правового режима использования территорий, доступности товаров и

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услуг, возможностей развития бизнеса. Рассмотрите проблемы соблюдения баланса публичных и частных интересов при условии соблюдения правовых рамок.

Блок 2. Задания на английском языке

Выберите одно задание (тему эссе или описание кейса) из данного блока и напишите эссе или дайте аргументированные ответы на вопросы к кейсу. Ответ должен быть написан на английском языке. Максимальный балл за выполнение задания из данного блока – 50.

1. **Topic 2.1. City Ratings.**

Below you will see detailed descriptions of two city ratings/indices. Both are aimed at comparing cities on multiple levels. These and other ratings/indices are often used by government officials and businesses, sometimes these raings/indices may be used by the general public for choosing a good city to live and work temporarily or permanently (however realistically these occasions are probably very rare).

Review the two city ratings/indices below. Compare the groups of indicators, the choice of indicators and the ways of calculating them (as well as the data sources). Critically asses how the choice of indicators may be affecting the city positions in the indices/ratings (especially consider the country-city scale of some variables), discuss how well the indicators actually reveal the meanings behind the names of the indicators groups. Which rating/index seems more objective to you and why? Discuss whether it makes sense for a city manager or mayor to use either one of these ratings as a benchmark and to try improving city position according to the corresponding indicators. If a city manager / mayor were to follow these ratings/indices as benchmarks, would that definitively lead to improving the quality of life of citizens?

IESE Cities in Motion Index 2016

Excerpts from executive summary of the 2016 IESE Cities in Motion Index:

"Smart cities generate numerous business opportunities and possibilities for collaboration between the public and private sectors. All stakeholders can contribute, so an ecosystem network must be developed that will involve all of them: members of the public, organizations, institutions, government, universities, experts, research centers, etc."

"[I]t must not be forgotten that the human factor is fundamental in the development of cities. Without a participatory and active society, any strategy, however intelligent and comprehensive, will be doomed to failure. Beyond technological and economic development, it is the public that holds the key for cities to go from "smart" to "wise." That is the goal to which every city should aspire: that the people who live there and their leaders deploy all their talent in favor of progress."

"The main goal of any city should be to improve its human capital. A city with smart governance must be capable of attracting and retaining talent, creating plans to improve education, and promoting creativity and research."

The rating indicators are listed below in tables.

Table 1. IESE Cities in Motion Index. HUMAN CAPITAL INDICATORS

Indicator	Description (and Units if applicable)	Source (if available)
Higher education	Proportion of population with secondary and higher education	Euromonitor
Business schools	Number of business schools (top 100)	Financial Times
Movement of students	International movement of higher-level students. Number of students	UNESCO
Number of universities	Number of universities	QS Top Universities
Museums	Number of museums per city	2thinknow
Art galleries	Number of art galleries per city	2thinknow
Expenditure on leisure and recreation	Expenditure on leisure and recreation. Expressed in millions of U.S. dollars at 2014 prices	Euromonitor

Table 2. IESE Cities in Motion Index. SOCIAL COHESION INDICATORS

Indicator	Description (and Units if applicable)	Source (if available)
Ratio of deaths	Ratio of death per 100,000 inhabitants	Euromonitor
Crime rate	Crime rate	Numbeo
Health index	Health index	Numbeo
Unemployment rate	Unemployment rate (number of unemployed / labor force)	Euromonitor
Gini index	The Gini index varies from 0 to 100, with 0 being a situation of perfect equality and 100 that of perfect inequality	Euromonitor
Price of property	Price of property as percentage of income	Numbeo
Ratio of women workers	Ratio of women workers in the public administration	International Labor Organization

Table 3. IESE Cities in Motion Index. ECONOMIC INDICATORS

Indicator	Description (and Units if applicable)	Source (if available)
Productivity	Labor productivity calculated as GDP/working population (in thousands)	Euromonitor
Time required to start a business	Number of calendar days needed so a business can operate legally	World Bank
Ease of starting a business	Ease of starting a business. Top positions in the ranking indicate a more favorable regulatory environment for creating and operating a local company	World Bank

Indicator	Description (and Units if applicable)	Source (if available)
Number of headquarters	Number of headquarters of publicly traded companies	Globalization and World Cities (GaWC)
Percentage of people at early business stage	Percentage of 18 to 64-year-old population who are new entrepreneurs or owners/managers of a new business	Global Entrepreneurship Monitor
Entrepreneurs	Companies in an initial phase that represent a city's economic bases. They represent economic dynamism and include a high proportion of companies devoted to technology. Used per capita	2thinknow
GDP	Gross domestic product in millions of U.S. dollars at 2014 prices	Euromon

Table 4. IESE Cities in Motion Index. PUBLIC MANAGEMENT INDICATORS

Indicator	Description (and Units if applicable)	Source (if available)
Total tax rate	Total tax rate. This measures the total amount of taxes and compulsory contributions paid by businesses after accounting for deductions and exemptions allowed as part of commercial pro ts	World Bank
Reserves	Total reserves in millions of current U.S. dollars	World Bank
Reserves per capita	Reserves per capita in millions of current U.S. dollars	World Bank
Embassies	Number of embassies per city	2thinknow
Twitter	Twitter users listed in prominent Twitter directories (e.g., Twellow). It includes users self-de ned as leaders (for example, writers, activists, business leaders and journalists). In thousands of people	2thinknow
Sales tax	Sales tax. This has a big impact on the economy. Lower rates of sales tax can be used to nance investment in services and intelligent infrastructure	2thinknow

Table 5. IESE Cities in Motion Index. GOVERNANCE INDICATORS

Indicator	Description (and Units if applicable)	Source (if available)
Strength of legal rights index	The strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate access to loans. The values go from 0 = low to 12 = high, where the highest ratings indicate that the laws are better designed to expand access to credit	World Bank
Corruption perceptions index	Corruption perceptions index. The values go from 0 = very corrupt to 100 = very transparent	Transparency International
Functions of the innovation department	Number of functions of the city's innovation department (or ministry if there is one)	2thinknow

Indicator	Description (and Units if applicable)	Source (if available)
Range of government Web services	Range of Web services for all city council users (residents or visitors). This is a measure of modern and technological municipal government. Scale from 0 to 5	2thinknow
Open data platform	This describes whether the city has an open data system	CTIC Foundation

Table 6. IESE Cities in Motion Index. ENVIRONMENTAL INDICATORS

Indicator	Description (and Units if applicable)	Source (if available)
CO_2 emissions	Carbon dioxide emissions that come from the burning of fossil fuels and the manufacture of cement. Measured in kilotons (kt)	World Bank
CO_2 emission index	CO_2 emission index	Numbeo
Methane emissions	Methane emissions that arise from human activities such as agriculture and the industrial production of methane. Measured in kt of CO_2 equivalent	World Bank
Percentage of the population with access to the water supply	Percentage of the population with reasonable access to an appropriate quantity of water resulting from an improvement in the water supply	World Bank
PM2.5	PM2.5 measures the amount of particles in the air whose diameter is less than 2.5 μm. Annual mean	World Health Organization
PM10	PM10 measures the amount of particles in the air whose diameter is less than 10 μm. Annual mean	World Health Organization
Pollution index	Pollution index	Numbeo
Environmental performance index	Environmental performance index (from 1 = poor to 100 = good)	Yale University

Table 7. IESE Cities in Motion Index. MOBILITY AND TRANSPORTATION INDICATORS

Indicator	Description (and Units if applicable)	Source (if available)
Traffic index	The traf c index is estimated by considering the time spent in traf c and the dissatisfaction this generates. It also includes estimates of CO_2 consumption and the other inef ciencies of the traf c system	Numbeo
Inefficiency index	The inef ciency index is an estimate of the inef ciencies in traf c. High values represent high rates of inef ciency in driving, such as long journey times	Numbeo
Number of road accidents	Number of road accidents per 100,000 inhabitants	Euromonitor
Metro	Number of metro stations per city	2thinknow

Indicator	Description (and Units if applicable)	Source (if available)
Flights	Number of arrival and departure ights (air routes) in a city	2thinknow
Means of transportation	The means of transportation represents the public transportation options for smart cities. The value of the variable increases if there are more transportation options. The lack of transportation options can make a city less attractive as a smart destination	2thinknow
Index of traffic for commuting to work	Index of traffic considering the journey time to work	Numbeo

Table 8. IESE Cities in Motion Index. URBAN PLANNING INDICATORS

Indicator	Description (and Units if applicable)	Source (if available)
Percentage of the population with access to sanitation facilities	Percentage of the population with at least suf cient access to facilities for the disposal of excreta that can ef ciently avoid the contact of humans, animals and insects with excreta	World Bank
Number of people per household	Number of people per household	Euromonitor
Bicycle shops	Number of bicycle shops per capita	2thinknow
Architects	Number of architecture rms per capita	2thinknow

Table 9. IESE Cities in Motion Index. INTERNATIONAL OUTREACH INDICATORS

Indicator	Description (and Units if applicable)	Source (if available)
Number of international tourists	Number of international tourists who visit the city. In thousands of people	Euromonitor
Number of passengers of an airline	Number of passengers who travel with airlines. In thousands of people	Euromonitor
Hotels	Number of hotels per capita	2thinknow
Sightsmap	Ranking of cities according to the number of photos taken in the city and uploaded to Panoramio (community for sharing photographs online). The top positions correspond to the cities with the most photographs	Sightsmap
Number of conferences and meetings	Number of international conferences and meetings that take place in a city	International Meeting Congress and Convention Association

Table 10. IESE Cities in Motion Index. TECHNOLOGY INDICATORS

Indicator	Description (and Units if applicable)	Source (if available)

Indicator	Description (and Units if applicable)	Source (if available)
Number of broadband subscribers	Number of broadband subscribers per country with a digital subscriber line, cable modem or other high-speed technology, per 100 inhabitants	World Bank
Broadband	Number of broadband users within a city, including wireless and xed connections	2thinknow
IP addresses	Number of IP addresses per capita	2thinknow
Facebook	Number of Facebook users per capita	2thinknow
Mobile phones	Number of mobile phones per capita	2thinknow
Quality of Web services	The quality of the city council's website measures the commitment of its information technology policy, support for the development of local businesses and other technology initiatives. Scale from 0 to 5, the maximum corresponding to the website with the best-quality services	2thinknow
Innovation index	Innovation index. Valuation of 0 = no innovation to 60 = a lot of innovation	Innovation Cities Program
Smartphones	Number of smartphones per capita. The use of smartphones and their penetration are a good indicator for the use of technologies	2thinknow
Wi-Fi hot spot	Number of wireless access points globally. These represent the options to connect to the Internet that businesspeople have when they travel	2thinknow

Positions in IESE Cities in Motion Index:

1. New York
2. London
3. Paris
4. San Francisco
5. Boston
6. Amsterdam
7. Chicago
8. Seoul
9. Geneva
10. Sydney
…

104. Guanzhou
105. Jerusalem
106. Cordoba
107. Zagreb
108. Moscow
109. Istanbul
110. Bucharest
111. Bogota
112. Taiching
113. Athens

End of IESE Cities in Motion Index 2016

Cities of Opportunity 7 (by PriceWaterhouseCoopers) (2016)

Excerpts from executive summary of the Cities of Opportunity 7:

"This all returns to two urban truths. The rst involves the need for cities to possess balanced, ultimately reinforcing, qualities. We've described this in the past as "a virtuous circle of social

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and economic strengths"—or, put another way, a city's capacity to excel in many reinforcing aspects of urban community, to make complexity manageable, and to generate a high standard of life for as many people as possible. In 2012, the great biologist E.O. Wilson described this to us as an "autocatalytic reaction [where] the product itself becomes a catalyst. [And] the reaction speeds things up...and it just takes off exponentially."
That points to the second truth. While Cities of Opportunity primarily focuses on centers of business, nance, and commerce, it's the human element sitting at the center that pushes everything forward, makes it all work. Strong correlations point to this. Humans are the city, not an afterthought."

"The intellectual capital and innovation indicator focuses on education and, secondarily, the innovation that a highly educated society generates. Technology readiness, our second indicator, frames the technological potential of a really smart city—one that "uses digital intelligence to improve citizens' lives," as Carlo Ratti, director of the MIT Senseable City Lab, tells us."

Table 11. Cities of Opportunity. Intellectual capital and innovation

Indicator	Description (and Units if applicable)	Source (if available)
Libraries with public access	Number of libraries within each city that are open to the public divided by the total population and then multiplied by 100,000.	OBA Amsterdam Public Library International Federation of Arts Councils and Culture Agencies World cities culture forum Etc…
Math/Science skills attainment	Top performers' combined mean scores on the math and science components of the Program for International Student Assessment (PISA), an Organisation for Economic Co-operation and Development (OECD) assessment of 15 year-olds' academic preparedness. Top performers are defined as those students who achieved in the top two proficiency levels (Level 5 and Level 6) on the math and science portions of the test. Comparable examinations are used wherever possible to place cities not included in the OECD assessment.	OECD PISA Database TIMMS 2011 Data Release WEF Global Technology Report 2013
Percent of population with higher education	Number of people who have completed at least a university-level education divided by the population aged 15+. A university-level education is set equivalent to a Bachelor's degree or higher from a US undergraduate institution.	Economische Verkenningen Metropoolregio Amsterdam 2013 China National Sample Survey on Population Changes Statistisches Bundesamt (2014): Bildungsstand der Bevölkerung DANE – National Department of Statistics (Departamento Administrativo Nacional de Estadística) Etc…

Indicator	Description (and Units if applicable)	Source (if available)
World university rankings	The Times Higher Education World University Rankings 2014-2015 powered by Thomson Reuters are the only global university performance tables to judge world class universities across all of their core missions - teaching, research, knowledge transfer and international outlook. The top universities rankings employ 13 carefully calibrated performance indicators to provide the most comprehensive and balanced comparisons available, which are trusted by students, academics, university leaders, industry and governments.	The Times Higher Education World University Rankings 2014-2015 powered by Thomson Reuters
Innovation Cities Index	The 2thinknow Innovation CitiesTM index is composed of 445 cities selected from 1,540 cities based on basic factors of health, wealth, population, geography. The selected cities had data extracted from a city benchmarking data program on 162 indicators. Each of the benchmarking data were scored by analysts using best available qualitative analysis and quantitative statistics. (Where data were unavailable, national or state estimates were used). Data were then trend balanced against 21 global trends. The final index had a zeitgeist (analyst confidence) factor added and the score reduced to a three-factor score for Cultural Assets, Human Infrastructure and Networked Markets. For city classification, these scores were competitively graded into 5 bands (Nexus, Hub, Node, Influencer, Upstart). The top 33% of Nexus and Hub (and selected Node cities of future interest) final graded scores were ranked by analysts based on trends over 2-5 years. A node ranking is considered globally competitive.	2thinknow Innovation CitiesTM Program (2014 Index)
Intellectual property protection	Leading business executives' responses to the question in the World Economic Forum's Global Competitiveness Report 2014-15 that asks, "In your country, how strong is the protection of intellectual property, including anti-counterfeiting measures?" [1 = extremely weak; 7 = extremely strong]. The 2014 edition of the Survey captured the opinions of over 14,000 business leaders in 148 economies between February and June 2014.	Global Competitiveness Report 2014-2015, World Economic Forum

Indicator	Description (and Units if applicable)	Source (if available)
Entrepreneurial environment	The Global Entrepreneurship and Development Index measures the '3A's' of entrepreneurial development: attitudes, aspirations and activity. The index was created by the Global Entrepreneurship and Development Institute to help provide better understanding of economic development by analyzing the contextual nature of business formation, expansion, and growth.	The Global Entrepreneurship and Development Institute (GEDI Index 2014)

Table 12. Cities of Opportunity. Technology readiness

Indicator	Description (and Units if applicable)	Source (if available)
Internet access in schools	Leading business executives' responses to the question in the World Economic Forum's Global Competitiveness Report 2014-15 that asks, "In your country, how widespread is Internet access in schools? [1 = nonexistent; 7 = extremely widespread]". The 2014 edition of the Survey captured the opinions of over 14,000 business leaders in 148 economies between February and June 2014.	Ookla - broadband testing and web-based network diagnostic applications
Broadband quality score	Based on millions of recent test results from Pingtest.net, this global broadband index from Ookla compares and ranks consumer broadband connections around the globe. Our overall broadband index score encompasses the following weighted metrics that were collated over a six-month period to generate an average: upload speed (40%), download speed (40%), quality of connection (10%), and value/cost (10%).	Ookla - broadband testing and web-based network diagnostic applications
Mobile broadband speed	Based on millions of recent cellular test results from Ookla Speedtest iOS and Android apps, this index compares and ranks cellular upload and download speeds around the globe. Each city receives a score based on the rolling mean speed in megabits per second (mbps) over the previous 30 days. Only tests taken within 300 miles of the server are eligible for inclusion in the index. Data were collected and averaged over a three month period in 2015.	Ookla - broadband testing and web-based network diagnostic applications

Indicator	Description (and Units if applicable)	Source (if available)
ICT usage	Ericsson's Networked Society City Index 2014 measures the performance of 40 cities from two perspectives: their maturity in information and communications technology (ICT) and triple bottom line, specifically sustainable urban development in a connected society. The ICT usage score is based on three variables—technology use, individual use, and public and market use. Within technology use, the following metrics were analyzed: mobile phone subscriptions per 100 habitants, number of smartphones per capita, percentage with a computer at home, and number of tablets per capita. Within individual use, the following metrics were considered: Internet usage as a percentage of the population and social networking penetration. Within public and market use, the following metrics were analyzed: open data and web presence, and electronic and mobile phone payments.	The Networked Society City Index 2014, Ericsson
Software development and multimedia design	Combination of scores for each city in fDi magazine's Best Cities for Software Development and the Best Cities for Multimedia Design Centres. Both fDi indices weight a city's performance 70% based on the quality of the location and 30% based on the cost of the location. The software design index is based on an assessment of 120 quality competitiveness indicators. These indicators include availability and track record in ICT, availability of specialized-skills professionals such as scientists and engineers, access to venture capital, R&D capabilities, software experts, quality of ICT infrastructure and specialization in software development. The Multi-Media Design Centre rankings are based on an assessment of 120 quality competitiveness indicators, including the size of the location's leisure and entertainment sector, its specialization and track record, information technology infrastructure, quality of life and skills availability.	fDi Intelligence

Indicator	Description (and Units if applicable)	Source (if available)
Digital security	This variable measures a city's levels of digital security based on factors such as dedicated cyber security teams (input) and the frequency of identity theft (output). Input metrics measured are privacy policy, citizen awareness of digital threats, public-private partnerships, level of technology employed, and dedicated cyber security teams. Output metrics are frequency of identity theft, percentage of computers infected, and percentage with Internet access. Data are produced by the Economist Intelligence Unit's Safe Cities Index 2015.	EIU Safe Cities Index 2015

Table 13. Cities of Opportunity. City Gateway

Indicator	Description (and Units if applicable)	Source (if available)
Hotel rooms	Count of all hotel rooms within each city.	CBRE: Netherlands Hotel MarketreView Beijing Statistical Yearbook 2013 Shanghai Statistical Yearbook 2013 Eurostat Horwath Hotel, Tourism and Leisure: Special Market Reports – Colombia Chicago Convention and Tourism Bureau
International tourists	Annual international tourist arrivals for 100 cities collected by Euromonitor International. Euromonitor's figures include travelers who pass through a city, as well as actual visitors to the city.	Euromonitor International's top 100 city destinations ranking 2016 Bogota District Institute of Tourism U.S. Department of Commerce: Office of Travel and Tourism Industries MasterCard 2014 Global Destination Cities Index Stockholm Business Region Etc…

Indicator	Description (and Units if applicable)	Source (if available)
International association meetings	A measure combining both the number of international association meetings per city in 2014 and the compound annual growth rate (CAGR) from 2009-2014. The meetings measured take place on a regular basis and rotate between a minimum of three countries. Figures provided by the International Congress and Convention Association.	International Congress and Convention Association
Incoming/Outgoing passenger flows	Total number of incoming and outgoing passengers, including originating, terminating, transfer and transit passengers in each of the major airports servicing a city. Transfer and transit passengers are counted twice. Transit passengers are defined as air travelers coming from different ports of departure who stay at the airport for brief periods, usually one hour, with the intention of proceeding to their first port of destination (includes sea, air and other transport hubs).	Amsterdam Airport Schiphol Airport- world and Beijing Capital Airport media centre Shairport Berlin Brandenburg Airport El Dorado International airport Fly Chicago Port Authority of NY and NJ San Francisco International Airport Oakland International Airport Etc…
Airport to CBD access	A measure of the ease of using public transit to travel between a city's central business district and the international terminal of its busiest airport in terms of international passenger traffic. Cities are separated into categories according to whether a direct rail link exists, if so the number of transfers required, and if not whether there is a public express bus route to the airport. Cities with direct rail links are preferred to those with express bus services. Cities with rail links with the fewest transfers are ranked higher than those with more. Within categories, cities are ranked against one another according to the cost of a single one-way, adult weekday trip and the length of the trip, with each factor weighted equally.	Netherlands Railways Amsterdam Info Travel China guide Explore Metro Explore Shanghai Berliner Verkehrsbetriebe (BVG) Berlin.de Bogota-airport.com Chicago Transit Authority Port Authority of New York and New Jersey Bay Area Rapid Transit Metro Planner Government of Dubai MTR Soekarno-Hatta International Airport Etc….

Indicator	Description (and Units if applicable)	Source (if available)
World Top 100 airports	Each city receives a score based on the ranking of that city's top airport in the World's Top 100 Airports ranking, compiled by Skytrax. The World Airport Awards are based on survey questionnaires completed by more than 13 million airline customers between May 2014 and January 2015 across 550 airports worldwide. The survey evaluates travellers' experiences across different airport service and performance indicators from check-in, arrivals, transfers, shopping, security and immigration to departure at the gate.	Skytrax World Airport Awards
Airport connectivity	A measure of the number of routes operating from the airports servicing a city as identified by World Airport Codes. A greater weight is given to international destinations, but domestic routes are also included so as not to penalize countries with larger land areas.	World Airport Codes

Table 14. Cities of Opportunity. Transportation and infrastructure

Indicator	Description (and Units if applicable)	Source (if available)
Mass transit coverage	Ratio of kilometers of mass transit track to every 100 square kilometers of the developed and developable portions of a city's land area. A city's developable land area is derived by subtracting green space and governmentally protected natural areas from total land area.	UrbanRail Amsterdam Tips Senate Department for Urban Development and the Environment Instituto de Desarollo Urbano Chicago Transit Authority Etc…
Affordability of public transport	The affordability of the longest mass transit rail trip from a city's boundary to the CBD, calculated by using a city's average hourly wage (UBS Prices and Earnings 2015) to determine the amount of time a citizen needs to work to be able to buy a single ticket. The cost of a bus trip is used in cities where there are no rail systems.	GVB Amsterdam City of Beijing Shanghai Metro Landes Berlin Trans Milenio Transit Chicago Metropolitan Transportation Authority BART Etc…
Licensed taxis	Number of officially licensed taxis in each city divided by the total population and then multiplied by 1,000.	Gemeente Amsterdam Beijingtrip.com Tour-Beijing.com visitberlin.de Angloinfo Etc…

Indicator	Description (and Units if applicable)	Source (if available)
Major construction activity	Major construction activity is composed of three equally weighted measures: the number of planned and under construction buildings in the Emporis database; the number of properties sold and recorded by Real Capital Analytics' database; and construction employment from Oxford Economics. The Emporis database is the count of planned and under construction buildings categorized as a high rise, skyscraper, low rise, hall, or stadium; the number of properties sold is based on the number of properties valued at more than $10 million, recorded between February and July 2015; and construction employment is taken as a percentage of total employment.	Emporis Real Capital Analytics Oxford Economics
Housing	Measure of availability, diversity, cost and quality of housing, household appliances and furniture, as well as household maintenance and repair. This measure is based on the Mercer Quality of Living 2014 survey. Tied cities were differentiated by looking at the annual percentage change in house prices.	Mercer Quality of Living 2014 reports International Monetary Fund (IMF) – House Prices Around the World
Traffic congestion	Measure of traffic congestion and congestion policies for each city scored on the level of congestion as well as the modernity, reliability and efficiency of public transport. Assessment based on the Mercer Quality of Living 2014 survey. Tied cities were differentiated using the ease of commute variable.	Mercer Quality of Living 2014 reports
Ease of commute	PwC employees in each of the firm's offices in the 30 cities were instructed: "On a scale from 1 to 10, where 1 is difficult and 10 is easy, please rate your commute to work". Data provided by the PwC employee survey conducted for the We, the Urban People study.	PwC Employee Survey 2013/2015

Table 15. Cities of Opportunity. Health, safety and security

Indicator	Description (and Units if applicable)	Source (if available)
Road safety	A count of the estimated number of road deaths in each country per 100,000 inhabitants. Raw figures are calculated by the World Health Organisation based on 2013 survey data and are published in the Global Status Report on Road Safety 2015.	World Health Organisation - Global Status Report on Road Safety 2015
Health system performance	Measurement of a country's health system performance made by comparing healthy life expectancy with healthcare expenditures per capita in that country, adjusted for average years of education (years of education is strongly associated with the health of populations in both developed and developing countries). PwC global healthcare team adapted methodology from the 2001 report "Comparative efficiency of national health systems: cross-national econometric analysis".	World Bank World Health Organization CIA World Factbook United Nations Statistics
End-of-life care	Ranking of countries according to their provision of end-of-life care. The Quality of Death Index by the Economist Intelligence Unit assesses the availability, affordability and quality of palliative care for adults in 80 countries across the world. The index scores countries across 20 indicators grouped in five categories: palliative and healthcare environment, human resources, affordability of care, quality of care and community engagement. These indicators are grouped into qualitative and quantitative categories and are normalized to form an overall index score.	2015 Quality of Death Index, Economist Intelligence Unit
Crime	Weighted combination of Mercer Quality of Living 2014 survey crime score (50%); intentional homicide rate per 100,000 of the city population (30%); and the Numbeo Crime Index, which is an estimation of the overall crime level in each city based on how safe citizens feel (20%).	Mercer Quality of Living 2014 reports Numbeo Crime Index 2015 UNDOC FBI Crime statistics Dubai Police Crime Stats SA Mayor's Office for Policing and Crime Etc…
Political environment	Measure of a nation's relationship with foreign countries, internal stability, law enforcement, limitations on personal freedom and media censorship. Data is from the Mercer Quality of Living 2014 survey.	Mercer Quality of Living 2014 reports

Indicator	Description (and Units if applicable)	Source (if available)
Security and disease risk	An analysis of the potential effects of crises on economic output in each city, calculated by measuring the percentage of GDP at risk from a series of individual health and security threats between 2015 and 2025. The nine threats measured were cyber attack, market crash, nuclear accident, oil price shock, sovereign default, terrorism, power outage, human pandemic, and plant pandemic. Data are taken from the Lloyd's City Risk Index 2015–2025.	Lloyd's City Risk Index 2015-2025 Cambridge Centre for Risk Studies

Table 16. Cities of Opportunity. Health, safety and security

Indicator	Description (and Units if applicable)	Source (if available)
Natural disaster exposure	A measure of a city's exposure to natural disaster risk, calculated by PwC's actuarial and forensics practice using data from Swiss Re's CatNet GDP Loss Index and the People Risk Index. This variable measures the economic and people effect of river and coastal floods, earthquakes, windstorms, and tsunamis. The economic effect is measured by lost GDP output in the immediate aftermath of an event relative to the country's GDP. The people effect is both the potential for fatalities and casualties, as well as people who need to be evacuated and are unable to access their home or workplace (in the immediate aftermath of an event) as a proportion of the population of the city. The indices are derived from Swiss Re's Mind the risk study (http://www.swissre.com/rethinking/climate_and_natural_disaster_risk/Mind_the_risk.html), results of which are available at CatNet (http://www.swissre.com/clients/client_tools/about_catnet.html).	PwC Actuarial and Forensics Practice Swiss Re Mind the Risk Study

Indicator	Description (and Units if applicable)	Source (if available)
Natural disaster preparedness	This measure takes into account each city's disaster preparedness. Using a method developed by PwC's actuarial and forensics practice, each city receives a score based on its preparedness. This measure considers whether the city has put in place early warning systems, made efforts to reduce the underlying risk factors, regularly conducts training drills, and implements strategies to increase public awareness. Fifty percent of the score is taken at a country level from the UNISDR's web platform, PreventionWeb, which has collated national progress reports on the implementation of the UN's 10-year plan to make the world safer from natural hazards, the Hyogo Framework for Action. Each city's average performance in the variables of public transport systems, health system performance, and operational risk climate are also factored into the disaster preparedness measure to make up the remaining 50%.	PwC's actuarial and forensics practice PreventionWeb
Thermal comfort	A thermal comfort score was created for each city by calculating the average deviation from optimal room temperature (72 degrees Fahrenheit). January, April, July and October heat indices were calculated for each city using an online tool that integrates average high temperature and corresponding relative evening humidity during each month. A final thermal comfort score was derived by first taking the difference between a city's heat index for each month and optimal room temperature and then averaging the absolute values of these differences.	World Metrological Society Weatherbase NOAA Worsley School
Recycled waste	Percentage of municipal solid waste diverted from landfill. This includes, but is not limited to, recycling and captures other methods such as waste-to-energy.	Financial times China Statistical yearbook 2013 Senatsverwaltung fur Stadtentwicklung and Umwelt Association Business Commitment for Recycling in Colombia (Asociación Compromiso Empresarial para el Reciclaje en Colombia -Cempre) Sustainable Chicago, Office of the Mayor 2015 Etc…

Indicator	Description (and Units if applicable)	Source (if available)
Air pollution	Combination of measures of particulate matter 10 micrometers (PM10) outdoor air pollution levels from the World Health Organisation (WHO) and the Numbeo Pollution Index of overall pollution in each city. The WHO's Public Health and Environment database provides annual mean concentrations of PM10 in diameters or less, reflecting the degree to which urban populations are exposed to this fine matter. The Numbeo Pollution Index is generated via survey-based data. Numbeo attributes the biggest weight to air pollution, then to water pollution/accessibility as the two main pollution factors. A small weight is given to other pollution types.	World Health Organization Public Health and Environment (PHE) Database Numbeo Air Pollution Index 2015
Public park space	Proportion of a city's land area designated as public recreational and green spaces to the total land area. Excludes undeveloped rugged terrain or wilderness that is either not easily accessible or not conducive to use as public open space.	Gemeente Amsterdam China Statistical Yearbook 2014 Senate Department for Urban Development and the Environment District Department of Culture Recreation and Sports (Secretaría Distrital de Cultura, Recreación y Deporte – SCRD) Parkscore index by The Trust for Public Land Government of Dubai Etc…
Water-related business risk	Water risks in a city related to quality, quantity, and regulatory risk. Quality risks are defined as the exposure to changes in water quality that may impact industrial production systems, resulting in the need for further investment or an increase in the operational costs of water treatment. Risks related to quantity are defined as the exposure to changes in water quantity (e.g., droughts or floods) that may impact a company's direct operations, supply chains, and/or logistics. Regulatory risk refers to the unpredictability of regulations within the business environment. These risks arise when an unexpected change in water-related law or regulation increases a business's operating costs, reduces the attractiveness of an investment, or changes its competitive landscape. Data produced by the World Resources Institute with Aqueduct.	World Resources Institute with Aqueduct

Table 17. Cities of Opportunity. Demographics and livability

Indicator	Description (and Units if applicable)	Source (if available)
Entertainment and attractions	Cultural experience from the A.T. Kearney Global Cities Index is measured by the number of diverse attractions in a city, including the number of major sporting events a city hosts; the number of museums, performing arts venues, and culinary establishments; the number of international travelers; and the number of sister city relationships.	PwC Actuarial and Forensics Practice Swiss Re Mind the Risk Study
Natural disaster preparedness	This measure takes into account each city's disaster preparedness. Using a method developed by PwC's actuarial and forensics practice, each city receives a score based on its preparedness. This measure considers whether the city has put in place early warning systems, made efforts to reduce the underlying risk factors, regularly conducts training drills, and implements strategies to increase public awareness. Fifty percent of the score is taken at a country level from the UNISDR's web platform, PreventionWeb, which has collated national progress reports on the implementation of the UN's 10-year plan to make the world safer from natural hazards, the Hyogo Framework for Action. Each city's average performance in the variables of public transport systems, health system performance, and operational risk climate are also factored into the disaster preparedness measure to make up the remaining 50%.	A.T. Kearney Global Cities Index 2014
Quality of living	Score based on more than 30 factors across five categories: socio-political stability, healthcare, culture and natural environment, education and infrastructure. Each city receives a rating of either acceptable, tolerable, uncomfortable, undesirable or intolerable for each variable. For qualitative indicators, ratings are awarded based on the Economic Intelligence Unit analysts' and city contributors' judgments. For quantitative indicators, ratings are calculated based on cities' relative performances on a number of external data points. Data sourced from the Economist Intelligence Unit's liveability ranking.	The Economist Intelligence Unit - Liveability Ranking and Overview 2014

Indicator	Description (and Units if applicable)	Source (if available)
Working age population	Proportion of a city's population aged 15-64 to the total population of the city.	Statistics Bureau of Amsterdam National Bureau of Statistics of China Statistik Berlin Index Mundi American Community Survey 5 year 2009-2013 estimates Baruch College Etc…
City brand	The Guardian Cities global brand survey measures two aspects of a city's brand: its "assets"—attractions, climate, infrastructure (particularly transport), safety, and economic prosperity— and its "buzz," a combination of social media (Facebook likes and Twitter sentiment analysis) and media mentions. The assets and buzz elements were both given a score out of 10; the numbers were then added to produce a total score.	The Guardian: Cities global brand barometer (produced by Saffron Consultancy)
Senior wellbeing	The Global AgeWatch Index presents a unique snapshot of the situation of older people in 96 countries. It highlights which countries are doing best for their older populations and how this links with policies toward pensions, health, education, employment, and the social environment in which older people live. The overall score takes account of income security, capability, enabling environment, and health status of the over 60s.	Global AgeWatch Index
YouthfulCities Index	A measure produced by YouthfulCities, a global database that measures, compares, and ranks 55 cities across 20 urban attributes using a total of 101 indicators. The indicators consist of primary and secondary data that Urban Decoders (a globally dispersed team of young urban researchers) collect locally and submit using collaborative, cloud-based research workbooks. The YouthfulCities Index is an ambitious collaborative effort to analyze the largest cities around the world from a unique youth perspective to rank them as best suited for young people aged 15–29. It looks at how youth live, work, and play in their urban setting in order to examine how cities are serving their youth. It asks how youth can be better integrated and engaged in their cities.	YouthfulCities.com

Table 18. Cities of Opportunity. Economic clout

Indicator	Description (and Units if applicable)	Source (if available)
Number of Global 500 headquarters	Number of Global 500 headquarters located in each city, as per the Fortune Global 500 list.	2014 Fortune Global 500
Employment growth	2014-2016 annual growth rate of employment in the city. Data provided by Oxford Economics.	Oxford Economics
Financial and business services employment	The number of jobs in financial and business services activity as a share of total employment in the city. Financial services include banking and finance, insurance and pension funding, and activities auxiliary to financial intermediation. Business services include a mix of activities across the following sub-sectors: real estate and renting activities, IT and computer related, R&D, architectural, engineering and other technical activities, legal, accounting, bookkeeping and auditing activities, tax and consultancy, advertising, and professional scientific and technical services and business services where not elsewhere classified. Data provided by Oxford Economics.	Oxford Economics
Attracting FDI	Combined variable ranking the number of greenfield (new job-creating) projects plus the total US$ value of greenfield capital investment activities in a city that are funded by foreign direct investment (FDI). Data cover the period from January 2005 through December 2014 provided by fDi Intelligence.	The Financial Times - FDI Intelligence
Productivity	Productivity is calculated by dividing GDP in 2015 US$ by employment in the city. Data provided by Oxford Economics.	Oxford Economics
Rate of real GDP growth	2014-2016 GDP annual growth rate in real terms expressed in 2015 US$. Data provided by Oxford economics.	Oxford Economics

Table 19. Cities of Opportunity. Ease of doing business

Indicator	Description (and Units if applicable)	Source (if available)
Ease of starting a business	Assessment of the bureaucratic and legal hurdles an entrepreneur must overcome to incorporate and register a new firm. Accounts for the number of procedures required to register a firm; the amount of time in days required to register a firm; the cost (as a percentage of per capita income) of official fees and fees for legally mandated legal or professional services; and the minimum amount of capital (as a percentage of per capita income) that an entrepreneur must deposit in a bank or with a notary before registration and up to three months following incorporation. Assessment scores gathered from Doing Business 2015 report, the World Bank Group. U.S. cities were differentiated from each other using the United States Small Business Friendliness survey by Thumbtack.com in partnership with Kauffman Foundation.	Doing Business 2015 report, the World Bank Group Thumbtack.com
Ease of entry: Number of countries with visa waiver	Number of nationalities able to enter the country for a tourist or business visit without a visa. Excludes those nationalities for whom only those with biometric, diplomatic or official passports may enter without a visa.	Government of The Netherlands Chinese Embassy website (Thailand) Federal Foreign Office website Visados.com US Department of State US Embassy in Ottawa, Canada Etc…
Number of foreign embassies or consulates	Number of countries that are represented by an embassy, consulate, high commission, depute high commission or representative office in each city. Figures sourced from Embassypages.com	Embassypages.com US Department of State Ministry of Foreign Affairs of the Russian Federation

Indicator	Description (and Units if applicable)	Source (if available)
Level of minority shareholder protection	Measurement of the strength of minority shareholder protection against misuse of corporate assets by directors for their personal gain. The Strength of the Investor Protection Index is the average of indices that measure "transparency of transactions," "liability for self-dealing" and "shareholders' ability to sue officers and directors for misconduct." Assessment scores gathered from Doing Business 2015, The World Bank Group.	Doing Business 2015 report, the World Bank Group
Operational risk climate	Quantitative assessment of the risks to business profitability in each of the countries. Assessment accounts for present conditions and expectations for the coming two years. The operational risk model considers 10 separate risk criteria: security, political stability, government effectiveness, legal and regulatory environment, macroeconomic risks, foreign trade and payment issues, labor markets, financial risks, tax policy, standard of local infrastructure. The model uses 66 variables, of which about one-third are quantitative. Data produced by Economist Intelligence Unit's Risk Briefing.	Economist Intelligence Unit's Risk Briefing
Workforce management risk	Ranking based on staffing risk in each city associated with recruitment, employment, restructuring, retirement and retrenchment. Risk was assessed based on 30 factors grouped into five indicator areas: demographic risks associated with labor supply, the economy and the society; risks related to governmental policies that help or hinder the management of people; education risk factors associated with finding qualified professionals in a given city; talent development risk factors related to the quality and availability of recruiting and training resources; and risks associated with employment practices. A lower score indicates a lower degree of overall staffing risk. Rank scores sourced from the 2013 People Risk Index produced by Aon Consulting.	Aon Consulting 2013 People Risk Index
Tax efficiency	Combination of the number of tax payments and the time required to comply by businesses during their second year of operation. The tax payments element reflects the total number of taxes and contributions paid, the method of payment, the frequency of payment, the frequency of filing, and the number of agencies involved for the case-study company. Time to comply measures the time taken to prepare, file, and pay three major types of taxes (corporate income taxes, value-added taxes, and labor taxes). Data provided by PwC UK from Paying Taxes 2016; taxes are accurate for the year ended 31 December 2014. The Paying Taxes 2016 report can be found at http://www.pwc.com/gx/en/paying-taxes/.	PwC UK Paying Taxes team

Table 20. Cities of Opportunity. Cost

Indicator	Description (and Units if applicable)	Source (if available)
Personal tax	The personal tax data reflect the average employee effective tax rate across manager, assistant, and support staff levels in each city economy. The employee effective tax rates were generated by PwC UK using data supplied for Paying Taxes 2016. Taxes are accurate for year ended 31 December 2014. The Paying Taxes 2016 report can be found at http://www.pwc.com/gx/en/paying-taxes/.	PwC UK Paying Taxes team
Cost of business occupancy	Annual gross rent divided by square feet of Class A office space. Gross rent includes lease rates, property taxes, maintenance and management costs. Data produced by CBRE Global Office Rents in US$.	CBRE: Prime Office Occupancy Costs December 2014 Cushman & Wakefield: Office Space Across the World 2014 Knight Frank: Africa Report 2015
Cost of Living	A relative measure of the price of consumer goods by location, including groceries, restaurants, transportation and utilities. The Consumer Price Index measure does not include accommodation expenses such as rent or mortgage. Figures provided by Numbeo.	Numbeo Cost of Living Index 2015
Affordability of rent	A measure of the affordability of rental accommodation in a city, calculated by offsetting the monthly rental cost of a 120m2 apartment against a city's average wages (UBS Prices and Earnings 2015). Rental prices were sourced from the Global Property Guide – where the cost of a 120m2 apartment was not available, the closest equivalent was used.	Global Property Guide UBS Prices and Earnings 2015
Purchasing power	Domestic purchasing power is measured by an index of net hourly wages (where New York = 100) excluding rent prices. Net hourly wages divided by the cost of the entire basket of goods and services excluding rent. The basket of goods relates to 122 goods and services. Data sourced from UBS Prices and Earnings 2015.	UBS Prices and Earnings 2015

Indicator	Description (and Units if applicable)	Source (if available)
Workforce management risk	Ranking based on staffing risk in each city associated with recruitment, employment, restructuring, retirement and retrenchment. Risk was assessed based on 30 factors grouped into five indicator areas: demographic risks associated with labor supply, the economy and the society; risks related to governmental policies that help or hinder the management of people; education risk factors associated with finding qualified professionals in a given city; talent development risk factors related to the quality and availability of recruiting and training resources; and risks associated with employment practices. A lower score indicates a lower degree of overall staffing risk. Rank scores sourced from the 2013 People Risk Index produced by Aon Consulting.	Aon Consulting 2013 People Risk Index
Tax efficiency	Combination of the number of tax payments and the time required to comply by businesses during their second year of operation. The tax payments element reflects the total number of taxes and contributions paid, the method of payment, the frequency of payment, the frequency of filing, and the number of agencies involved for the case-study company. Time to comply measures the time taken to prepare, file, and pay three major types of taxes (corporate income taxes, value-added taxes, and labor taxes). Data provided by PwC UK from Paying Taxes 2016; taxes are accurate for the year ended 31 December 2014. The Paying Taxes 2016 report can be found at http://www.pwc.com/gx/en/paying-taxes/.	PwC UK Paying Taxes team

Positions in Cities of Opportunity:

1. London
2. Singapore
3. Toronto
4. Paris
5. Amsterdam
6. New York
7. Stockholm
8. San Francisco
9. Hong Kong
10. Sydney
11. Seoul
12. Berlin
13. Chicago
14. Los Angeles
15. Tokyo
16. Madrid
17. Dubai
18. Milan
19. Beijing
20. Kuala Lumpur
21. Shanghai
22. **Moscow**
23. Mexico City
24. Johannesburg
25. Sao Paolo
26. Bogota
27. Rio de Janeiro
28. Jakarta
29. Mumbai
30. Lagos

End of Cities of Opportunity 7 (by PriceWaterhouseCoopers) (2016)


2. **Topic 2.2. Alternative statistics.**

A data analytics company conducted a research of boundaries of agglomerations. Instead of using classic census data or calculating transport isochrones (i.e. an estimate of agglomeration boundary with variable distance from a city centre or a city boundary with fixed travel time), data analysists used user photographs from Instagram.

Instagram users' locations were compared with the transport isochrones and agglomeration boundaries from other research. For a point (user) to be considered as part of agglomeration, the user needs to regularly commute between 2-3 points in a hypothetic agglomeration including a hypothetic centre of that agglomeration.
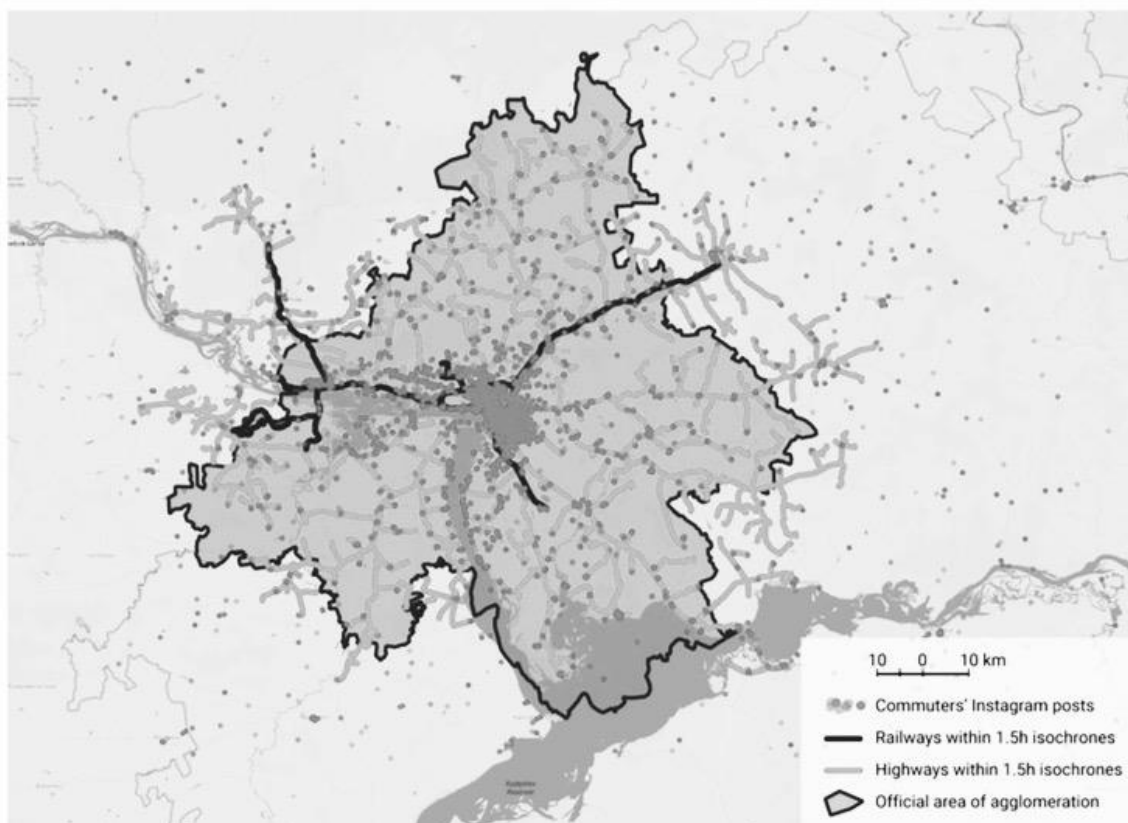
Some of the results of the research are presented in images below.
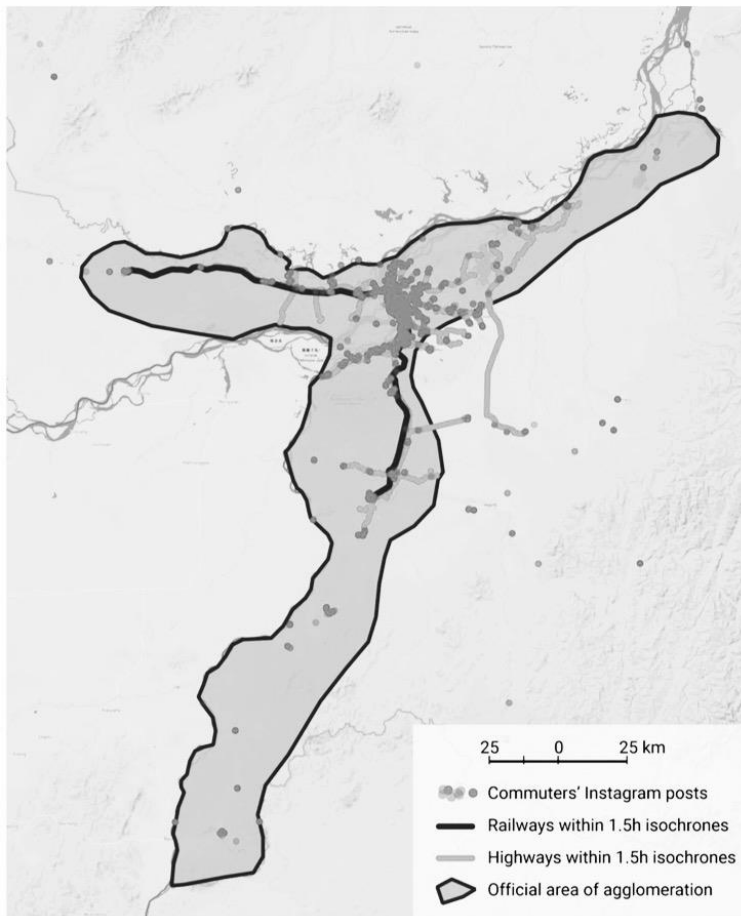
Research results: Khabarovsk (Image by Habidatum International, Inc.)

Национальный исследовательский университет «Высшая школа экономики»
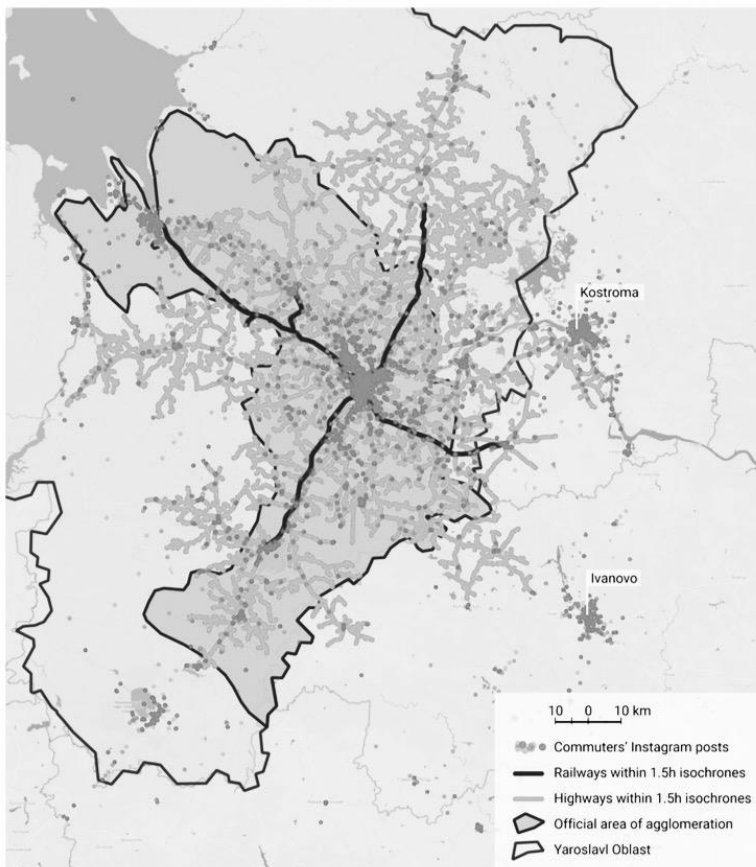
Research results: Yaroslavl (Image by Habidatum International, Inc.)

Research results: Kazan (Image by Habidatum International, Inc.)

Discuss the challenges and opportunities of using new data sources such as the one used here tosubstitute official statistics considering the described research and its results.
What about prospects for using this data in the long run?