Urban Observatory™

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Urban Observatory™

Executive Summary: Comparing the Great Cities of the 21st Century

In today's complex, interrelated world, unique challenges impact the growth and health of cities in every country. For the first time ever, more than half the world's population lives in cities. By the year 2050, that figure will rise to nearly 70 percent.[*] What does this mean for people living in those cities? And what does this mean for the government agencies and businesses providing services?

- The phenomenon of urban growth is making an impact on individuals and communities.
- The impact of urban growth is becoming considerably more difficult to understand, and understanding this impact is essential.
- We need data if we are to fully appreciate this phenomenon and its impact.

Unfortunately, no two cities in the world collect information in the same way. The questions are not asked the same way, using a common language. Maps are drawn not to the same scale or use the same symbology. There are no consistent, shareable plans illustrating street networks, power grids, water distribution, and petroleum infrastructure. Population age, water quality, health care, income, cost of living, or quality of life cannot be viewed in a dynamic, comparative way from cities in Asia to Africa to the Americas.

The result—despite vast stores of data captured, collated, and stored, there is limited knowledge and understanding. There is no sense of comparative scale or complexity. There is only confusion and questions left unanswered.

The **Urban Observatory** seeks to provide understanding through comparison and contrast. Brought to you by **Richard Saul Wurman**, **Jon Kamen of @radical.media**, and **Jack Dangermond of Esri**, it provides context that gives way to meaning. The Urban Observatory experience addresses a need for a systematic method of data visualization and cohesion. It creates understanding for people using common maps and data that speak a unifying language. The Urban Observatory empowers people to examine, compare, and contrast the global cities of the 21st century.

[*] United Nations, Department of Economic and Social Affairs, Population Division: *World Urbanization Prospects, the 2011 Revision*: Highlights. New York, 2012.

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The Urban Observatory

The concept behind the Urban Observatory consists of creating a living museum experience with a data pulse. It is the result of the visionary thought leadership of Richard Saul Wurman, Jon Kamen, and Jack Dangermond. The goal is to open up data and provide people with access to live, dynamic content from cities around the world. Using digital maps, they will be able to compare and contrast information for greater understanding of life in the 21st century.

By taking advantage of cloud computing, advanced display technology, and rich collections of data, people can simultaneously view answers to the most important questions that impact today's cities. In addition, they can interact and provide their own user-generated content. Ultimately, they will be able to have the key to understanding—unified authoritative data in comparative format.

The Urban Observatory consists of two primary components: an immersive exhibit and interactive website.

Immersive Exhibit—The Urban Observatory exhibit provides a unique, immersive experience unlike any other. Dynamic data, authoritative maps, and related content are derived from many sources and forms.

Website—A powerful website will supply the data backbone and rich functionality to easily view and interact with all types of information. The website is the foundation for the exhibit and will be available to the general public via a simple web browser.

The Exhibit

Initially, the Urban Observatory exhibit will feature 5–10 cities from around the world. It will display maps and data on large flat screen monitors mounted on pylons, one for each featured city.

Computer stations at the exhibit will enable visitors to interact with city maps. Most of the exhibit functionality will be available via the Urban Observatory website, which will also include story maps and apps and user-generated content.

Each exhibit pylon will show a rotating series of dynamic data from a variety of sources that will include video fly-overs of cities and real-time camera feeds of popular city street intersections and other areas of interest.

Each pylon will provide the heart of the exhibit: GIS-derived thematic maps that compare urban features and trends.

The pylons will feature interactive stations for people to sit down and view cities of interest. Each station will have access to easy-to-use applications and story maps.

Visitors will walk into an immersive environment, surrounded by screens displaying a continuous program of constantly changing thematic maps and content.

As a new thematic map is displayed on one city pylon, similar themes will appear for each of the featured cities. For instance, a map showing population trends will appear simultaneously for each of the participating cities for people inside the exhibit to view. Through these maps, visitors will peer into the underpinnings of the world's leading cities, gaining a visceral and factual sense of their interrelated systems. They will be able to see similarities and differences not apparent using other means.

Many different types of maps will enrich the exhibit and website. Maps will switch from planimetric to two- and three-dimensional and from point location dot maps to imagery and color-coded thematic maps. In addition, maps and dynamic collections will combine into a single unified experience that will continually loop within the interior exhibit space.

Web applications will provide an individual, personalized experience. Each pylon will allow people to sit down and open applications and view data maps.

Maps will be organized into five major categories for both the immersive and the customized experience:

- Work
- Movement
- People
- Public
- Systems

Each category includes a number of subcategories organized into "nouns or subject" representing more specific map themes relating to one of the five categories. In addition to the nouns, more precise thematic subcategories organized by "verbs or magnitude" provide the capability to drill down into additional specific issues and city phenomena. For example, people may see one map of the street network in a city and then another map that features its daily traffic volume and a third that shows its average speeds.

The Website

The vision of the Urban Observatory is to foster conversations by visualizing physical, demographic, and cultural patterns of cities. At the core of the Urban Observatory is the map comparison application that digitally powers the exhibit and individual user experience. The Urban Observatory map comparison application permits the comparisons of cities side-by-side.

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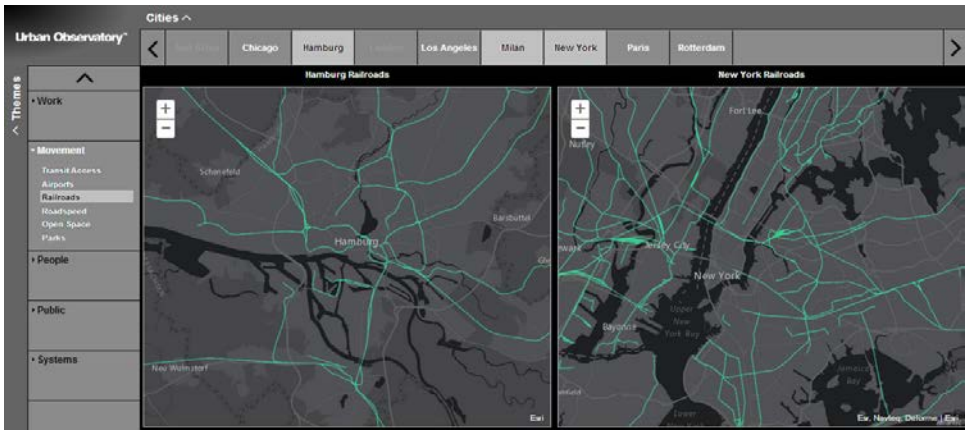

The Urban Observatory website will allow anyone to compare cities using a simple web browser.

The map information will ideally be served by each city (with infrastructure provided by Esri if necessary) using standard templates, web services, and web applications via the Urban Observatory website. The digital map cartography will be simple yet elegant. Maps will be visually striking and stylistically consistent, ensuring that all cities share a common display. A key element of all comparisons among cities will be the presentation of data at a common scale. As users zoom in to one city map, other city maps will zoom in parallel, revealing similarities and differences in density and distribution. To the extent possible, thematic maps will reflect common data models, ensuring that information is truly comparable among the cities.

In addition to the web functionality already mentioned, several other applications will be accessible over time via the website or through tablets and other handheld devices.

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Data: The Power behind the Urban Observatory

What makes the Urban Observatory so valuable is the data that can be visualized and contextualized for comparative analysis. Government agencies at all levels, private businesses, nonprofit organizations, and individual citizens can all benefit by accessing rich, live content that's continuously updated.

Specific data indicators provide information about people, their use of the land, and the infrastructure needed to service those uses. The indicators below provide an easy-to-understand view of a city. They represent cross-cutting areas for both Urban Observatory participation and experience.

- **Work—**From industrial to commercial, the impact of city work leaves an indelible imprint on cities. Data related to environmental impacts, employment by industry and occupation, annual revenues, and growth will be available.

- **Movement—**Residential land use, home and building ownership, demographic levels, health care, and more, will give users specifics about the people who build, work, and sustain the planet's living cities.

- **People—**The individuals, families, and communities of people living within cities make up the cultural and sustaining force of city life. Demographic, education, health care, population, age, crime, and poverty datasets are common attributes everyone can relate to and find interest in when comparing and contrasting cities.

- **Public—**People will have viewable access to the institutions that serve as community pillars. This will include educational facilities, government facilities, law enforcement and public safety structures, hospitals, museums, and observatories.

- **Systems—**The infrastructure and networks that intricately weave together within city landscapes indicate how many people, assets, and resources connect. Electric, gas, water, sanitation, building footprints, and other systems will be included.

How Can the Observatory Help Your City?

The world's largest and most influential cities have the opportunity to join a first-of-its-kind information experience and user architecture that takes advantage of GIS as an integrative platform. Information about policy and urbanization does not exist in comparative form. Several cities have already signed on to participate. By contributing, they empower citizens, constituents, colleagues, and the global community. They also engage in a visionary project that brings powerful understanding, one person at a time.

Who Will See the Urban Observatory?

The first iteration of the Urban Observatory exhibit will be unveiled at the 2013 Esri International User Conference, where more than 15,000 attendees from more than 150 nations, steeped in geographic disciplines, representing all walks of life and professionals and volunteers at every level, will have access to the Urban Observatory.

The international, multilingual audience will not only walk through an exhibit but experience a technological, visual immersion in maps and information. In addition, the Urban Observatory website and applications will launch at the same time as the exhibit. The exhibit will resonate with individuals both in attendance and around the globe asking the questions specifically of interest to them as they look at the cities.

Unlike a museum where visitors walk through predetermined static content, Urban Observatory participants design their own experience, looking at the latest dynamic data provided by the participating cities. The website allows participants to bookmark and share their comparisons with others, thus bringing the Urban Observatory home with them.

What Cities Will Be Included?

Cities will be selected from a list of candidates for the first iteration of the Urban Observatory experience. Determination will be based on a number of criteria, including geography, current population, rate of growth, historic or cultural significance, and technological advances. What's significant is that *every participating city will benefit*.

While only 5–10 cities will be included in the first iteration of the Urban Observatory, the lifeblood of the experience—the Urban Observatory web application—will be available to all participating cities.

Why Should Cities Participate?

By participating in the Urban Observatory, cities will gain access to the power of cloud-based GIS capabilities. The freely available service can be used to build and share maps about the data indicators. Those maps are used by several applications, each designed to be consumer-friendly.

Participation represents a no-cost opportunity to take advantage of cloud-based GIS services that use geography as a platform to deliver useful and actionable information.

Participants also join a global network of cities that are collaborating and sharing information and comparing urban patterns on a common standard.

How Do I Participate?

You can easily participate in the Urban Observatory—without any added hardware, software, or work on your end—by supplying data about your city and country. Esri will use this data to develop a common template harmonizing differences in attributes and definitions and preparing a standard cartography applicable to all participating cities. In the first iteration of this project, Esri will also publish this reformatted data for visualization. This data can then spur heightened communications, additional questions, and understanding.

If you have datasets in any of these categories, we urge you to contribute them to the project:

- Land cover/Land use/Zoning
- Population—By smallest census unit
- Demographics—By smallest census unit
- Income—By smallest census unit
- Household size—By smallest census unit
- Housing cost—By smallest census unit

- Housing density—By smallest census unit
- Housing type—By smallest census unit
- Crime statistics—By smallest census unit and point locations
- Educational level—By smallest census unit
- Labor force participation—By smallest census unit
- Road networks—Categorized by type, speed limits, and traffic volume
- Public transit networks (trains, streetcars, buses, subway, etc.)—Lines and stations
- Ferry ports and ferry lines and volumes of passengers
- Airports and heliports and volumes of flights and passengers
- Public transit participation—Number of riders per network
- Fire station locations—Number of staff per location (if available)
- Law enforcement facilities—Number of staff per location (if available)
- Hospital locations—Number of beds by type (i.e., general versus critical care)
- Emergency rooms—Number of beds
- Schools and universities
- Sports facilities (arenas, stadiums, tracks, aquatic centers, etc.)
- Cultural points of interest (museums, theaters, markets, observatories)
- Religious facilities (churches, shrines, mosques, temples, synagogues, monasteries, etc.)
- Public libraries
- Building footprints—Coded by number of stories
- Open public spaces (parks, arboretums, gardens, beaches, forests, nature reserves, etc.)
- Cemeteries and crematoria

- Military reservations and facilities
- Correctional facilities—Coded by number incarcerated (if available)
- Air quality monitoring stations and values
- Environmental hazards/pollutants (refineries, power plants, smelters, etc.)—Locations
- Sanitation—Where and how the city handles waste; major networks and facilities
- Water—Where and how the city gets its water; major networks and facilities
- Electricity—Where and how the city gets its power; major networks and facilities
- New construction/permits

To participate, simply visit www.urbanobservatory.org and complete the form. The Urban Observatory team will review the information provided and contact you regarding how to proceed. Join others in one of the paramount projects of the 21st century.

Conclusion

The Urban Observatory provides a comparative understanding of our world. It tells the story of the global community through analysis of our largest, most unique urban cities. Interactive maps and standardized sets of information allow users to look at every aspect of life: people, population, work, systems of movement, and more. The Urban Observatory provides three unique deliverables—the exhibit, a website and applications. All three work in unison to enlighten and engage people.

Your participation is essential. Information about city urbanization simply does not exist in the comparative format offered through the Urban Observatory. You have the opportunity to join a first-of-its-kind global educating endeavor. Data makes it possible. By contributing, you empower your citizens, constituents, colleagues, and the global community. If you have data you believe is appropriate and would like to participate in the Urban Observatory, please complete the participation form online at www.urbanobservatory.org to get started.

The Urban Observatory is both a visual representation of questions and answers that lead to understanding as well as a documentation and celebration of human beings and their capacity to create. Perhaps equally important, it demonstrates the power of geography and maps as a common language of understanding.

Esri inspires and enables people to positively impact their future through a deeper, geographic understanding of the changing world around them.

Governments, industry leaders, academics, and nongovernmental organizations trust us to connect them with the analytic knowledge they need to make the critical decisions that shape the planet. For more than 40 years, Esri has cultivated collaborative relationships with partners who share our commitment to solving earth's most pressing challenges with geographic expertise and rational resolve. Today, we believe that geography is at the heart of a more resilient and sustainable future. Creating responsible products and solutions drives our passion for improving quality of life everywhere.

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