The Brookings Institution
Metropolitan Policy Program

National Infrastructure for Community Statistics: An Overview

dg.o2005

Birds-of-a-Feather Session

May 17, 2005

The Urban Markets Initiative

- Three-year effort supported by Living Cities
  - collaborative of 15 nonprofit, private and public investors committed to the revitalization of America's urban centers
- Improve quality and use of data and information available for urban areas, in order to:
  - Allow private and public decision-makers to identify untapped investment opportunities
  - Improve the quality of investment decisions
  - Increase the competitiveness of urban areas as places for investment

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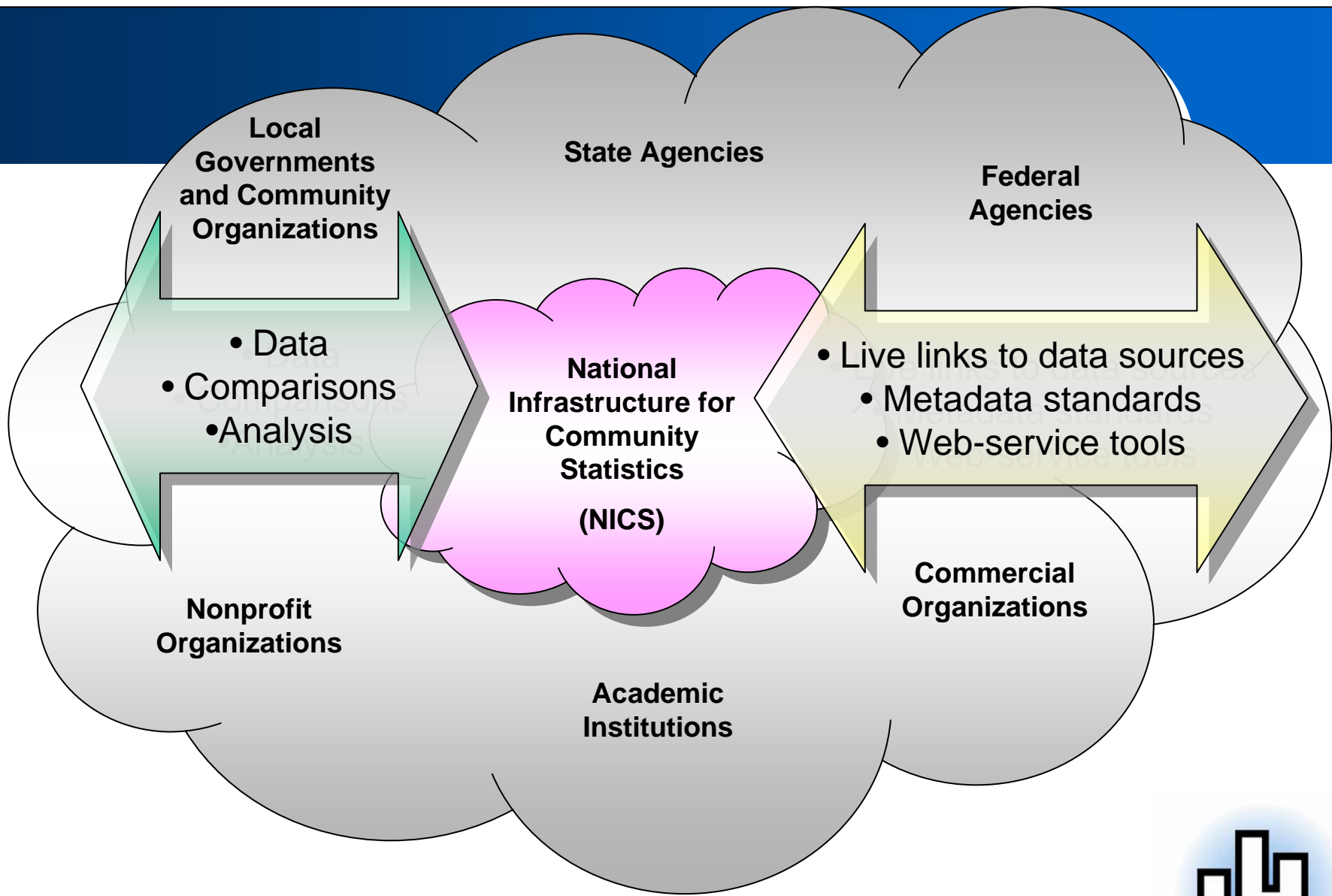# National Infrastructure for Community Statistics: What

- Community-level data (metro, place, neighborhood, parcel):
  - from multiple sources (federal, national nonprofit, state, local, and commercial)
  - that can be easily combined, compared and analyzed
  - across domains and jurisdictions
  - for better decision-making

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NICS: How

- Web-based "marketplace" providing access to community-level data and tools with which to integrate, view and analyze these data
- <u>Marketplace</u>: a forum to exchange data, services and products. A place to match demand for and supply of:
  - <u>Data</u>: 1000s of community-level datasets
  - <u>Tools and Services</u>: to access, manage, combine, clean, compare, analyze, and present community statistics
- Service-oriented architecture

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NICS: Who

- NICS is intended as a "wholesale" resource for organizations involved in "retail" data-related activities serving broad audiences (e.g., data intermediary, federal program analysis).

- Participants – federal/state/local governments, research institutions and other nonprofits, commercial
    - Data providers and collectors
        - Including federal and state agencies with mandate to gather and analyze administrative data from local governments
    - Data intermediaries
    - Program agencies
    - Middleware and tool providers

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Local Governments and Community Organizations

State Agencies

Federal Agencies

- Data
- Comparisons
- Analysis

National Infrastructure for Community Statistics

(NICS)

- Live links to data sources
- Metadata standards
- Web-service tools

Nonprofit Organizations

Commercial Organizations

Academic Institutions

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Community Data Users

• Municipalities

• Metro Planning Orgs.

• Community-based Orgs.

• Data Intermediaries

 -- CSS Network

 -- NNIP

 -- Census Info Centers

• Indicators groups--poverty, sustainability, asset-building

State Agencies

• NGA

• State CIOs (NASCIO)

• State DHS, Health, Jobs

• State Budget Offices (NASBO)

• State Data Centers (Census)

• State Archives

Federal Agencies

• Federal Statistical Agencies (FedStats, Census, BLS, BEA, NCHS, etc.)

• Federal Program Agencies (e.g., EDA, ETA, FHwA)

• Federal Management Orgs. (OMB, GAO, CIO Council)

National Infrastructure for Community Statistics

(NICS)

Nonprofit

• DataPlex (Fannie Mae Foundation

• KNII (National Academy of Sciences)

Foundation/ Investor Users

• Outcomes data

• Comparative data

• Performance measurement

• Success Measures

• SIA Models

Academic

• University analysts

• University service providers

Commercial

• Data Providers

• Value-added Data Intermediaries

• Market Research

• Analysts

• Services

Potential Impacts of NICS

- Greater understanding of community socioeconomic and geophysical conditions, trends and opportunities

- More effective program and investment decisions

- Improved measurement of program and investment impacts

- Enhanced local and national indicators efforts

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Potential Impacts of NICS

- Expanded base of users of federal statistics
- Significant enhancement of federal ability to access locally produced data
- Greater linkage among multiple federal efforts regarding community statistics and mapping
- Enhanced federal and state investments in e-government initiatives

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NICS Community of Practice

- Mission – promote the development of NICS
- Involves over 100 representatives from
  - Federal agencies (e.g., OMB, Census, EPA, GSA, USGS/FGDC, FedStats, BJS, IRS, HUD, HHS, GAO, Federal Reserve, FDIC)
  - State agencies (e.g., Maryland Department of Planning)
  - Local organizations (e.g., City of Baltimore, Metro Chicago Information Center, National Association of Counties)
  - Academia (e.g., MIT, University of Florida, University of Memphis)
  - National nonprofits (e.g., Fannie Mae Foundation, Joint Center for Political and Economic Studies, Urban Institute)
  - Commercial firms (e.g., Claritas, Maya Design)

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NICS Process

- Concept Phase (May-August 2004): Develop NICS concept, create CoP
- Learning Phase (September 2004-February 2005)
  - Four workshops to ascertain desirability and feasibility of NICS from perspective of local, state, federal, private, nonprofit organizations
  - $250,000 raised for Initiation Phase
- Initiation Phase (March 2005-June 2006)
  - Business plan
  - Services development
  - Organizational development (surveys, fundraising)
  - Prototype web gateway
- Implementation Phase (June 2006 -)

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Participant Needs: Motivating Examples

Local policy and program analysts want access to data at small areas of geography, for uses such as determining:

- **Neighborhood crime/health-risk rates**: number of incidents / population at risk
- **Program eligibility**: what percent of households meet income cutoff given size, local rent levels, etc.
- **Neighborhood (dis)investment**: what parcels are ripe for reinvestment, what federal $ are going into a neighborhood
- **Employment and resident patterns**: where do local residents work (by skill level); what jobs are accessible; how has this changed over time

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Participant Needs: Problems

Explosion of fine-grained, spatially detailed data is great, **but**:

- Hard to **get/keep/maintain local copy** of all the needed/useful data
- Too hard to **get/understand/use metadata**
- Cross-domain **geographies are different** so small-area data are hard to overlay well
- Hard to add **local knowledge to reinterpret** government datasets
- **Privacy and confidentiality** rules limit access to small-area data

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Participant Needs: Data

- ## Data for small areas + metadata
  - Recognize much data exists, particularly administrative, but not now accessible
  - Recognize importance of data standards, good metadata, tools to facilitate access

- ## Data topics, highest priority for state/local
  - Economic development, community development/real estate, program eligibility determinations, health, public safety, environment, infrastructure
  - Reliable denominators for small area indicators

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Participant Needs: Tools

- Small area estimation models/tools
- Tools and methods to address confidentiality
  - For example, synthetic estimates for small areas
- Mapping tools to bridge different geographies and permit comparisons over time
  - For example, police precincts, planning districts, census tracts
- Data entry/publishing tools to allow input of data into system with quality controls

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Participant Needs: Services

- Means to develop and maintain metadata

- Managing and operating distributed data systems

- Managing organizational and legal issues (e.g., data sharing, intellectual property)

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Promising Developments

- Metadata
  - Improved metadata standards, tools, best-practices
  - Progress with semantic web, ontologies, RDF, etc.
- Service-oriented architecture
  - Shared data services instead of exchanged data sets
  - Loosely coupled, distributed components (not tight coupling with 'broadcast' model)
  - Growth of web services with XML messaging and interoperable geospatial services
- Analytic assistance and user interfaces
  - Codifying 'business rules,' data mining, and analytic processes
  - Synthetic data, custom 'rollups,' and trusted intermediaries
  - Improved user interfaces for statistical analysis

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Participants Bring Resources

- State/Local
  - Data from local systems
    - More multi-source systems have been developed although need to develop intermediaries many more places
  - Networks to widen NICS participation

- Federal
  - Data from national files
  - Existing state/local partnerships networks
    - e.g., Labor Market Information agencies, State Data Centers, Census Information Centers
  - Guidance on standards
    - e.g., meeting requirements for GASB 24, OMB's Data Reference Model

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Sobering Realities

- Hard to switch focus from data sets to data services
  - New paradigm, immature technologies
- Community statistics involves analysis
  - Appropriate re-use of data is hard (not just data access)
  - NICS audience wants time series (as well as cross-sectional studies)
- Data integration for small-area geographies is hard
  - Serious privacy/confidentiality limits
  - Stored data <> delivered data – lots of on-the-fly processing
- Separate GIS and statistics communities

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To Address These Needs

- NICS will provide a marketplace providing access to community-level data and tools with which to integrate, view, and analyze these data

- Utilizing a service-oriented architecture format

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Service Categories: Data and Tools

- NICS-ready datasets
  - Services such as FedStats, DataPlace, federal statistical agencies, local data intermediaries, and more
  - Directories of administrative records available for public use
  - Services to meet minimum metadata standards
  - Provide information on data quality

- Data transformation tools
  - Cross-referencing tools
  - Façade tools
  - Standardization tools
  - Geographic roll-up tools
  - Synthetic data tools to ease analysis of sensitive or confidential datasets

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More Tools

- User interface tools
    - Display software to ease comparisons
    - Usability tools
    - Visualization tools
    - Aesthetics tools
- Analytic tools
    - Tools to determine eligibility for federal funds
    - Small area estimation tools
    - Automated computation tools to calculate margins of error
    - Microdata analytic tools
    - Indicator development tools, such as profile templates that generate standard indicators
    - Comparability analysis tools
    - Statistical literacy tools

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And More Tools

- Resources for building and operating distributed systems
  - Management
  - Operation
  - Service-chaining
- Resources for managing organizational and legal issues
  - Data-sharing or exchange MOUs
  - Data access protocols
  - Intellectual property management
  - Privacy and confidentiality

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And Finally

- Metadata tools and services
  - Model components of metadata
  - Hints for metadata development
  - Library of metadata standards
  - Metadata applications
  - Automated tools for attaching metadata

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Initiation Phase: Key Tasks

- Prepare business plan
- Complete market surveys that assess:
  - Broad range of information users
  - Decision-makers who use information
- Stimulate the creation of NICS services, and demonstrate NICS feasibility, through "use cases"
- Develop approach to creating metadata
- Develop initial web presence developed and prototype "gateway"
- Continue to educate/update/involve/expand CoP
- Raise implementation phase funds and secure institutional sponsorships as required to move into implementation

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Use Case Examples

- LEHD
- Pittsburgh-KNII prototype
- EPA Region 4 Technology Demonstration
- Local Virtual Data Warehouse efforts
    - Boston, Memphis, Indianapolis, Chicago
- Statistical Knowledge Network
- CDC Environmental Public Health Tracking Network
- Fannie Mae Foundation's DataPlace

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For Further Information

For NICS CoP events agendas, presentations, and participants:

http://colab.cim3.net/cgi-bin/wiki.pl?NationalInfrastructureforCommunityStatistics

Comments, questions:

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