

Strategy # 2: Democratize Information

In order to develop a coordinated, proactive, and efficient approach to development, Metro Boston needs to build its capacity to use data and information at the local, regional, and state level. Many of the MetroFuture recommendations depend on timely access to accurate and geographically appropriate data. The region should align data collection to support key policy and development decisions, maintain a strong “information infrastructure,” support critical data intermediaries needed to design and maintain the infrastructure, and improve the use of decision support tools that can help diverse stakeholders to engage in complex planning issues.

However, today accurate and timely data is often not available to decision makers and citizen advocates. Data stored in centralized data centers aren’t easily available. The rich information contained in administrative databases are not necessarily available to policymakers. Where they are available, data sets often cannot be compared or cross-referenced because common indexes do not exist. Finally, key data on pressing policy issues is often not available in a timely manner.

Metro Boston is well-positioned to pilot a new approach to regional data collection that can overcome these obstacles. According to this different way of thinking, local, regional, and state actors can act now to create a “federated” system of data sources and services by leveraging open source standards and planning for interoperability. A strong “information infrastructure” of consistent standards and protocols creates flexibility, saves money, and fosters collaboration across state agencies and the public.

This new approach will require several steps. Policymakers and the organizations involved in collecting and analyzing data should work together to ensure the necessary information is available to craft effective policy and better understand the region. To connect information to decisions and support civic engagement, investments should be made to improve state and local capacity to utilize planning and decision support tools. State and regional data intermediaries—organizations that collect, analyze, and disseminate data, will need both new strategies and new resources. Finally, these intermediaries should take strategic steps to build and maintain a comprehensive information infrastructure.

A. Align data collection and policymaking

State and local policy makers shape the future of the region, but don’t always have the information necessary to make informed choices. Providing policy makers with timely, accurate and up-to-date information empowers them to make sound decisions by assessing the impacts of different alternatives. Accurate data also allow the public to benchmark government performance and hold elected officials and policy makers accountable for their actions. Individual businesses and households also need data to make decisions: where to site a business, buy a home, or raise a family. Data about the region’s residents, business, and infrastructure are critical to strategically target limited resources. The evolving regional economy will require new ways to utilize existing data, and invest in collection of missing data.

However, today information in important areas is incomplete or missing, and decision-makers lack objective measures to evaluate the region’s progress. Furthermore, accuracy of basic demographic data and estimates used for a wide range of purposes should be improved.

To address these problems, a regional indicators program should be created to measure progress toward MetroFuture using objective data. The region should prioritize collecting or making available ten critical datasets needed for regional planning. These include such basic data as regional water and sewer infrastructure, parcels, and zoning maps. Additionally, new databases of developments, permits, and brownfields are needed for effective regional planning and analysis. Other missing data include an updated travel demand survey and aerial photography, and compiling and releasing employment and income information already possessed by state agencies. Finally, steps should be taken to prepare for the 2010 Census, and work proactively with the U.S. Census Bureau to ensure they have accurate information about our communities.

1) Establish a regional indicators programs to measure progress toward MetroFuture

MetroFuture establishes bold, achievable, and measurable goals for growth, preservation, and equity in Metro Boston. A diversity of policy recommendations contained in the implementation plan are designed to move the region toward a brighter future. A regional indicators framework is necessary to make periodic, quantitative assessments of conditions in the region. Such assessments will support policy development as well as accountability. Regional indicators should include information at a variety of levels, providing an understanding of conditions in the region generally, as well as a comparison of conditions across and within municipalities.

Issues of regional equity deserve special attention and will be addressed in an “equity report card” that is a companion to regional indicators. The equity report card will assess inequities in the region and within municipalities, in a variety of different areas; it will help raise awareness of these inequities; and it will support development of policies to reduce disparity.

1.a MAPC should produce a periodic indicators report and make the data and report available on-line at the MetroBoston DataCommon

1.b MAPC and allied organizations should create an Equity Report card

2) Collect Metro Boston’s “Top Ten Most Wanted Data Sets”

Certain data sets are not widely available but are particularly important to MetroFuture implementation. The “top ten most wanted data sets” are missing pieces critical to more informed planning and public policy decisions. For example, both MetroFuture and the Commonwealth’s Sustainable Development Principles promote growth near existing infrastructure such as water and sewer lines; however, there is no comprehensive collection of regional information about where that infrastructure exists.

While some of the data sets listed below require new data collection, much of this information is already collected by the state for administrative reasons. Administrative data sets, even those that lack personal data, are often inaccessible to planners and policy makers due to confidentiality concerns, lack of accountability, and lack of consistent funding. Therefore, filling these identified needs does not necessarily involve expensive data collection efforts. Instead, standards that institutionalize data sharing as part of an overall federated data-sharing infrastructure can make existing data more widely available. Furthermore, the strategic use of technology is transforming the nature of data collection.

New urban sensing and data collection technology will make possible an entirely new type of dataset. Sustainable datasets should be updated on a regular or ongoing basis, be stored in an easy-to maintain and share format, and be formatted to facilitate analysis and cross-referencing with other data.

- 2.a MassGIS and MAPC should work together to create a Regional Parcel Database.**
- 2.b MAPC should develop a regional development database**
- 2.c The Executive Office of Transportation and Central Transportation Planning Staff should complete a household travel demand survey every ten years**
- 2.d MassGIS should regularly commission aerial photo surveys and derived land use information from the data**
- 2.e MassGIS, the Legislature, and local utilities should develop a region-wide map of water and sewer infrastructure**
- 2.f MassGIS and MAPC should create a region-wide zoning map**
- 2.g The Executive Office of Labor and Workforce Development (EOLWD) should participate in the Local Employment Dynamics program.**
- 2.h The Department of Revenue should make available timely demographic summaries of state income tax filings by municipality**
- 2.i The Massachusetts Permit Regulatory Office in collaboration with MAPC should implement a statewide permit tracking database**
- 2.j EPA, the Executive Office of Environmental Affairs, and MAPC should create a Brownfields database**

3) Ensure Massachusetts is accurately counted in the Decennial Census

U.S. Census population statistics determine the size of the state's congressional delegation and Massachusetts's share of over \$300 billion of annual federal funding. The uniquely comprehensive Decennial Census population data is used to influence the distribution of public funding, inform the design of public programs, and guide business decisions. With its moderate growth rate, Massachusetts is at risk of losing congressional representation and funding to faster growing states. Under-counting the region's population in the 2010 Census and subsequent Decennial Censuses could cost the state millions of dollars and affect the funding for many programs that support vulnerable populations and basic infrastructure.

Public agencies at all levels of government have the responsibility to support an accurate census count.

- 3.a **The Secretary of State should form a statewide Complete Count Committee to prepare for 2010 Census**
- 3.b **Each municipality should create a Complete Count Committee to implement local outreach plans in cooperation with Census officials**
- 3.c **Every municipality should designate one individual responsible for Census 2010 preparation**
- 3.d **The Commonwealth should allocate \$3 million in funding for outreach efforts to hard-to-count populations**
- 3.e **The Legislature should provide funding to assist municipalities with outreach to hard-to-count populations**
- 3.f **School districts should implement the “Census in the Schools” curriculum**
- 3.g **Community-based organizations should assist the Census Bureau in reaching out to hard-to-count populations**

4) Inform US Census efforts through the Population Estimates Program

With the leadership of Secretary of State William Galvin, Massachusetts currently funds a Population Estimates Program, contracting with the University of Massachusetts Donahue Institute. Each year the Census Bureau issues annual population estimates for each municipality in the state; many of the recent Census estimates have undercounted the population for a variety of reasons, with a variety of impacts. The Population Estimates Program helps protect the Commonwealth against undercounting by (1) conducting independent annual estimates, (2) developing local and regional partnerships to collect relevant data, (3) working with the Census Bureau to ensure that they have up-to-date and complete information, and (4) supporting necessary challenges to the Census numbers.

Census assumes no change to group quarters, like dormitories, nursing homes, or other institutions when calculating annual estimates unless provided with evidence to the contrary. In the first year of the project, the University of Massachusetts Donahue Institute-Population Estimates Program identified over 230,000 persons living in group quarters in Massachusetts; 38 municipalities in the MAPC region submitted information to the estimates program about group quarters in their communities. This program help will improve the accuracy of Census 2010, but does not replace the need for education and outreach for the decennial Census.

- 4.a **The Secretary of State should contract annually with the State Data Center at the Donahue Institute to prepare independent annual estimates of the state’s population**
- 4.b **The State Data Center at UMass Donahue Institute and Regional Planning Agencies should work with municipalities to gather local data in a timely manner**

- 4.c **The Secretary of State and State Data Center at UMass Donahue Institute should provide support for municipal challenges to Census annual population estimates**

B. Improve state and local capacity to utilize planning and decision support tools

Advances in technology mean new tools for policy analysis and visualization are available to policymakers. These tools can communicate complex datasets, illustrate proposals, and facilitate discussion. They can provide the high level of transparency, access to high-quality information, and faithful public participation the public has come to expect. Used appropriately, these tools can help the public consider long time horizons, conduct holistic analyses incorporating multiple variables, and place local design and planning choices in a regional context. Combined with other reforms, new technology can contribute to a streamlined public participation process where citizens and advocates are empowered and informed.

However, significant challenges exist: technology evolves rapidly and requires training and resources to use properly. Most importantly, they require accurate, up-to-date, and detailed data inputs. A federated data system with timely and updated datasets will support the use of decision support tools.

In order to expand use of these tools, the region should create a clearinghouse of technology and expertise, and municipalities should incorporate these tools into local planning processes.

5) Expand appropriate use of visualization and decision support technology in the region

Recent years have seen tremendous advancement in “planning support tools” that help regulators and stakeholders to understand the implications of different approaches to planning and development. Such tools can help to build consensus, resolve disputes, and maintain consistency and accountability over time, and can be applied at a variety of different scales and time horizons, from an individual development proposal to a comprehensive plan.

MetroFuture itself used such tools (in particular, the Community Viz software model) to help educate participants about the implications of alternative scenarios across a wide variety of topic areas. Other planning support tools include more information about existing conditions or regional growth trends that will affect local conditions and should inform local decisions.

However, many municipalities do not have the capacity to utilize such planning support tools. Some towns have little data on recent development and current conditions; even fewer have the capacity to evaluate different future alternatives in a data-driven context. The “buildout” maps funded by the state in 2000 contained useful information but the associated projections did not functionally support alternative decision-making.

Decision support tools such as the Community Viz model could draw on the information contained in these maps to evaluate the impacts of alternative plans or development proposals.

- 5.a **MAPC and/or a regional public educational institution should create a clearinghouse of technology and expertise for visualization and decision support tools**
- 5.b **Municipalities should invest in training and technology needed to incorporate decision support tools into local planning processes**

C. Support State and Regional Data Intermediaries

Data intermediaries play an important role in a federated data system, through data collection, analysis, interpretation, and dissemination. Data intermediaries are typically public or non-profit organizations with important characteristics: they are in a position to maintain trust of data providers and users over long term, they are not linked to short term political interest, they follow appropriate protocols, and they are held accountable to the public.

Although the state has cultivated areas of expertise around data issues, these efforts are often uncoordinated and episodic. Furthermore, no intermediary exists with the resources and authority to establish standards and protocols across the state to enable sharing and comparison between existing organizations.

MassGIS, the state's critical resource for spatial information, has a clear strategic plan that should be implemented. A new state organization is needed to identify standards, create index files for comparison, and address privacy and other concerns to make available knowledge contained in administrative databases. Boston's regional data intermediary, the MAPC Data Center and GIS Lab, are well positioned to provide technical support and data to local organizations and municipalities. Supporting these groups will facilitate efficient use of existing data while supporting new types of comparison and analysis.

6) Implement Massachusetts Office of Geographic and Environmental Information (MassGIS) Strategic Plan

MassGIS provides the state's most comprehensive database of spatial information for planning and environmental management. It is a critical resource for municipalities, planners, educators, and residents. Recent legislation established MassGIS as Massachusetts' official agency for the collection, storage, and dissemination of geographic data, also giving it the mandate to set standards for geographic data to ensure universal compatibility across state agencies and municipalities

MassGIS has been engaged in a strategic planning process to identify and resolve the problems associated with the lack of a coordinated approach to GIS data use. The resulting plan contains both clearly achievable goals and a clear vision for the agency. The various data sets and infrastructure investments described in the plan would help MAPC and other Regional Planning Agencies to plan for the future and develop information infrastructure.

- 6.a **The Governor and Legislature need to provide funding and resources for implementation of the MassGIS Strategic Plan**

7) Establish a Commonwealth Center for Data

The state needs an organization to establish standards to enable comparison between public and private datasets, work with State departments to make administrative data available, establish policies and guidelines for data management and sharing, and provide leadership to overcome obstacles to achieving a federated data system. A fully funded Commonwealth Center for Data within the state administration would function as a critical component to a statewide data infrastructure, enabling data to inform public policy, planning, and evaluation.

The Commonwealth Center for Data should coordinate with other existing data intermediaries such as MassGIS, UMass State Data Center and Regional Planning Agencies. Lead by the Commonwealth Center for Data, these organizations would work together to take advantage of data resources offered by Federal agencies such as the U.S. Census Bureau, Bureau of Labor, and Federal Geographic Data Committee as well as to provide local knowledge to improve the accuracy of all federal administrative and survey data about Massachusetts.

The Commonwealth Center for Data would be critical in addressing the various barriers to data collection and use illustrated by the “top ten most wanted data sets”, including confidentiality concerns, lack of standards across data sets, and a lack of accountability. The Governor needs to designate one organization and work with the legislature to fund them consistently.

7.a The Governor, MassGIS, UMass Donahue Institute along with members of the Interagency Consortium for Population Statistics (ICPS) should undertake a strategic planning process to create and fund a Commonwealth Center for Data

8) Strengthen MAPC’s Data Center and GIS Lab as Metro Boston’s Regional Data Intermediary

MAPC has provided data, mapping, and technical assistance to its communities since its founding in 1963. MAPC’s Data Center and GIS Lab functions to collect and analyze regional data, make this data available to the public, and help build analytic capacity at the local level. It accomplishes this by responding to data and mapping requests from municipalities and citizens, completing scenario analyses, and operating the MetroBoston DataCommon website. The information and technology resources available to MAPC directly impact the 101 cities and towns, hundreds of organizations, and thousands of citizens that relies on MAPC for data, analysis and mapping each year. In many cases, MAPC’s Data Center and GIS lab are a critical link between state agencies and municipalities in gathering data and analyzing trends. MAPC has the local networks and relationships with planners on the ground as well local knowledge of the landscape as well.

Several of the recommendations in the MetroFuture Implementation Strategy involve further outreach and collaboration with local governments to help in the task of assembling and maintaining key data sets such as parcels, land use developments and zoning changes. Helping communities to better understand data, its successful collection and quantitative analysis to inform public policy and planning decisions at a local level will be an important enabler for this type of cooperation. What’s needed is direct technical assistance to municipalities. As Massachusetts has 351 communities with limited meaningful county

government, the best way to do this is by having MassGIS, the State Data Center and other State departments who work with data engage regional data intermediaries. It is more effective and cost efficient for these agencies to utilize MAPC through contracts and retainers instead of trying to duplicate effort or reinvent the wheel.

D. Build and maintain strong “information infrastructure”

In order for timely and accurate data to be available, State agencies and municipalities must make significant changes to their information infrastructure. All too often, public data sets released to the public contain inconsistent geographic divisions and categories. Well meaning officials seeking to protect confidentiality are too often overly conservative and release no data whatsoever. Information systems and department policies are structured solely to administer programs, with little regard to serving up data for evaluation or to inform public discourse. Uncoordinated technology purchases result in incompatible systems that do not communicate with each other, and inconsistent funding make creating a coherent information system challenging. Although some towns and departments are technology leaders making strategic, forward-looking investments in Information Technology (IT) infrastructure, many are behind and even further threatened by budget cuts.

New technology, standards, and protocols make a new type of IT infrastructure possible. The Commonwealth can start implementing a federated data center approach to the state one agency and municipality at a time. A service oriented architecture making web services available over the Internet can make new forms of data collection and analysis possible and realize investment efficiencies. Finally, ensuring that all the data that is harvested from these efforts remains public information is critical. Municipalities and state agencies will need continued leadership, technical assistance and incentives from the state’s Information Technology Division to shift to this new paradigm. The resulting information infrastructure will be characterized by a nimble information systems that exchanges data quickly and efficiency through web services for use in a wide range of purposes.

9) Create the information infrastructure necessary to make data accessible in a timely manner

The traditional approach to manage data has been the “data center” model. In this approach, users access a central workstation or server that contains multiple data sets. Several problems limit the usefulness of this approach. The centralized data center model is easily overwhelmed as the spatial complexity and number of relevant data sets greatly increases; copies of records on the data center server cannot be easily updated as changes occur, subjecting it to misinterpretation; individual data sets are ill-matched with one another, making comparison and integration difficult. A new approach can address these concerns and take advantage of the usability and interactivity of new technology.

A federated data center model seamlessly connects multiple data sources to stakeholders and decision makers over the Internet. Official data sources publish information using common data structures, formats and tools that allow cross-referencing of key datasets. Intelligent data intermediaries will analyze the raw data, and make it available to a variety of users. While the new system both depends on and encourages collaboration, it will not require data providers to alter their current collection methods. In this approach, data intermediaries will focus on creating and managing a shared framework for data interoperability, maintaining

relationships with a cluster of data providers, and providing streamlined data services. The State's MassGIS as well as the Federal government's Data Ferret have set up the infrastructure to provide data in this manner. Currently no data intermediary is positioned in the region or in the state to take advantage of the investments and resulting efficiencies.

- 9.a MAPC should develop an open source and interoperable data sharing platform**
 - 9.b MAPC will work with Department of Urban Studies and Planning at Massachusetts Institute Technology (MIT) to implement middleware**
 - 9.c MAPC, MassGIS, state agencies, and academic partners should create a working group to establish standards that allow analysis across multiple data sources**
 - 9.d State agencies should adopt service oriented architecture (SOA) for all departments and information technology investments**
 - 9.e MAPC, municipalities, and public agencies should adopt open standards when they can provide superior total cost of ownership and interoperability to proprietary systems and formats**
 - 9.f The Legislature in collaboration with the State's Information Technology Division (ITD) should create incentives to encourage adoption of open standards and software**
- 10) Use licensing to allow public use of government-created data while protecting agency interests.**

Government agencies should take steps to protect the public interest when releasing or licensing data. Government information should be available to the public for review, and be available for unencumbered private or noncommercial derivative uses. However, agencies may restrict commercial use of data or charge fees to help recover the cost of data creation.

- 10.a The Commonwealth should review all data sharing agreements and licenses**
- 10.b The Commonwealth should establish best practices for licensing government data**
- 10.c The Commonwealth should claim the specific copyright license on government data, reports, and other works and include citation guidelines**

¹ Commonwealth of Massachusetts Executive Office for Administration and Finance Information Technology Division, Policy #ITD-APP-01, "Enterprise Open Standards Policy," Effective January 13, 2004.