

The Integrated City Sustainability Database

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Introducing the (ta)ICSD

- The first comprehensive nation-wide dataset of US municipal governments' sustainability programs and policies;
- Will add missing elements to the research infrastructure for the study of local government policy;
- Will be publicly available in the future for use by researchers and practitioners.
- (ta)ICSD – “totally awesome integrated city sustainability database



Project Rationale

- Local governance provides a valuable setting for the study of political decision-making, policy innovation, and organizational functioning.
- The lack of comprehensive public data on local sustainability has led scholars to:
 - Focus on small number of case studies;
 - Conduct research with qualitative orientation;
 - Rely on surveys with modest response rates and limited scope of information.



Integrated City Sustainability Database (ICSD)

- The first comprehensive nation-wide dataset of US municipal governments' sustainability programs
 - The ICSD integrates data from seven nation-wide surveys of city sustainability programs conducted in 2010-2011
 - All seven surveys included all cities with populations over 50,000 in their sampling frame;
 - Over 90% of all cities larger than 50,000 responded to at least one of these seven surveys;
 - Four surveys additionally included smaller cities.



ICSD Source Surveys

Survey Name	Sampling Frame	Respondents	Response Rate
International City Management Association (ICMA)	8,569 local governments with a population over 10,000	2,176	25.4%
National League of Cities (NLC)	1,708 mayors in cities over 10,000	442	26.6%
EECBG Grantee Implementation (EECBG-Feiock)	970 municipal governments receiving EECBG awards, including all cities over 30,000	747	77.0%
Implementation of Energy Efficiency and Sustainability	1,180 cities: all with pops over 50,000 and a random sample of 500 cities with populations 20,000 to 50,000	679	57.5%
National Survey of Sustainability Management (SM-Hawkins)	601 cities with populations over 50,000	263	44.0%
Municipal Climate Protection (MCP-Krause)	664 cities with populations over 50,000	329	49.5%
Municipal Government Questionnaire (MG-Krause)	425 cities with populations over 50,000 that have explicit involvement in climate protection	255	60.0%



Two Different Integration Processes

- Matching & Harmonization (ICSD 1)
 - Matching Questions to Combine and Harmonize Responses
 - Three Tiered Matching and Harmonization Process
 - Applied to all cities
- Multiple Imputation (ICSD 2)
 - Missing values imputed based on all surveys and city characteristics
 - Complete data for all seven surveys
 - Applied to cities over 50K



Matching and Harmonization Process

- **Identifying similar questions across surveys and re-coding relevant data into a consistent form**
- **Aggregating into 3 tiers of over-arching variables**
 - - Questions for which there is a direct match – Tier 1
 - - Questions which measure the same concept or activity with different wording – Tier 2
 - - Questions which measure different components of a broader concept- Tier 3



Dedicated Budget – Tier 1

Survey	Wording in survey
EECGB	If the following have been adopted in your city, please indicate the time period: Provided a budget specifically for sustainability efforts Not adopted / adopted before 2009 / after 2009
NLC	Does your city have a dedicated budget for sustainability work? Yes / No / Don't Know
Hawkins and Wang	To finance sustainability, our city has... <input type="checkbox"/> Budgeted for the city government's sustainability initiatives
ICMA	Please indicate which of the following actions your locality has taken.... <input type="checkbox"/> Provided a budget specifically for the sustainability effort

"Staffing" – Tier 1

Survey	Wording in Survey
ICMA	Please indicate which of the following actions your locality has taken ... Dedicated staff to the sustainability effort
EECGB	If the following have been adopted in your city, please indicate the time period: Dedicated staff to the sustainability effort Not adopted / adopted before 2009 / after 2009
Hawkins and Wang	To develop and achieve goals for sustainability, our city has... a) Designated an office to coordinate city's sustainability initiatives b) Designated individual(s) (but not an office) to coordinate city's sustainability initiatives
NLC	Which scenario best describes your city's staffing on sustainability? a) Dedicated staffing in the city manager's office b) Dedicated staffing in the mayor's or council office c) Dedicated staffing within a single department d) Dedicated staffing spread across multiple departments e) No dedicated staffing but a citywide task force/ committee f) No dedicated staffing but goals recognized throughout departments g) No staffing

Dedicated Budget Tier 2

Survey	Wording in Survey
Krause1	Do climate protection activities receive designated funding in the city's budget? Yes / No
Krause2	[Has the city] Designated money in the city budget to fund climate protection activities Yes / No / In progress
Feiock 2010	Do energy conservation or climate protection activities receive designated funding in the city's budget? Yes / No



Staffing Tier 2

Survey	Wording in Survey
Krause 1	Has a single individual or office been tasked with coordinating the energy efficiency, sustainability, or "green" efforts across all city departments? a) Yes - this is the responsibility of a single individual b) Yes - this is the responsibility of a specific office or department c) This is under consideration or in progress d) No
Krause 2	Assigned a specific individual or group of individuals the responsibility to manage city climate protection activities Yes / No / In progress
Feiock 2010	Has your government established an Energy or Sustainability Office? No / Yes



Resource Commitment - Tier 3

Construct measures of broad concepts

Use imputed variables computed in Tier 2 and data reduction techniques to develop measures of broad concepts

Ex. Resource Commitment comprised of:

- ◆ Funding
- ◆ Personnel



Alternative Approach: Integration with Multiple Imputation

- Filling in the gaps in the data to allow statistical analysis
 - The method of multiple imputation (Little & Rubin, 1987; Rubin, 1987) is a well known procedure for generating an ensemble of imputed data sets on which analysis is conducted.
 - Statistical calculations are “pooled” across the many imputed sets and hypothesis tests are conducted according to the so-called “Rubin’s rules.”



Multiple Imputation Method with MICE

- Used the multiple imputation by chained equations (MICE) procedure (van Buuren & Oudshoorn, 2000; van Buuren & Groothuis-Oudshoorn, 2011)
- MICE is a Markov chain Monte Carlo (MCMC) method that builds a separate model for each variable under consideration, using the best guesses about the imputed values for other variables as predictors.
- The estimate of the replacement for missing information on each imputed variable (i.e., target variable)
- depends on a set of predictor variables. The MICE procedure chooses from a distribution of “best guesses” and then proceeds through the list of target variables until the predicted distribution of imputed values stabilizes. Each missing observation is replaced with a value from its plausible distribution, repeatedly, as the algorithm cycles through list of target variables.



Outcome of the Multiple Imputation Process

- The seven surveys produced an array of: 2,671 rows (one for each city) and 1,108 columns unique variables
- The PIs created a list of predictor variables for the MI estimations
- The MI technique was applied only to a cities with total population above 50,000 - since cities with populations between 10 and 50K were only included in two surveys, leaving 683 rows of data. Columns from the array were excluded when over 50% of the observations were missing
- 20 sets of imputed values were derived
- The final data sets include 1,010 variables, 992 of which were imputed, for 683 cities.



Benefits for Future Research

- Establishing a baseline for variables to facilitate the development of panel data;
 - EECBG followup surveys
 - Integrated City Sustainability Survey
 - 2018 NSF Sustainability Research Network Survey
- Standardizing a subset of key questions to encourage researchers to apply the format specified and update the database with new data a
- ICSD data will be a valuable resource to
 - Urban sustainability researchers;
 - Scholars working to advance general knowledge in local policy, implementation, and governance;
 - Practitioners interested in benchmarking their city's achievements with others.



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The FSU Jerry Collins Local Governance Research Laboratory is housed in the Askew School of Public Administration and Policy School. The Lab is a team of scholars pursuing research that seeks to improve our understanding of local governments and governance institutions in metropolitan regions. It was founded in 2000 as a program in the Devoe Moore Center for the Study of Critical Issues in Economic Policy and Government.

The ongoing research programs of the lab include economic development, boundary change, service delivery, network governance, energy and sustainability. The work in each of these research areas began with informal working group made up of faculty, students, and visiting scholars. Although the issues studied are diverse, they share a common focus on the role of formal and informal institutions in shaping local governance process, policy, and performance. Students seeking a Ph.D in Public Administration seeking to join the LocalGov lab should have a strong academic record and research interests falling within one or more of Lab's programs. Visiting faculty seeking to affiliate with the Lab need to be engaged in research projects that will contribute to these programs.

The research of the lab has generated over 1 million in external research grants including five National Science Foundation research grants as well as awards from Lincoln Institute for Land Policy, Aspen Institute, IBM Center for the Business of Government, and the Fulbright Scholar Program. In addition to the research programs the Lab supports symposia and a distinguished lecture series.

- Florida State University
- Blackboard@FSU
- Askew School of PA
- Institute for Energy, Economics & Sustainability
- Integrated City Sustainability Database Project
- EECBG Implementation Project
- Solid Waste Management and Green Jobs Project
- Water Governance Project
- NSF-RCN Sustainable Cities
- APSA Urban Section
- Center for Research in Public Policy and Administration
- L.P. Cookingham Institute of Urban Affairs UMKC
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