Institutional Arrangements

City Planning Labs

Municipal Spatial Data Infrastructure

The last decade has witnessed an urban data revolution, as cities internationally have started mobilizing geospatial data to harness the potential of urbanization and address its challenges.

City Planning Labs (CPL) is a Technical Assistance program of the World Bank, which aims to enhance the technical and institutional capacity of municipal governments to produce, share, and utilize geospatial data for evidence-led urban planning. The foundation of CPL includes the establishment of a robust and innovative **Municipal Spatial Data Infrastructure (MSDI)** platform. An MSDI ensures the sustainability of geospatial innovations being introduced, and is being pioneered by partner cities in Indonesia. In addition, agile and adaptable **Urban Planning Tools** are aimed at empowering cities to make informed decisions to improve the quality of life of their residents.

CPL's approach is aligned with the **World Bank's Build, Boost and Broker framework** as it Builds critical municipal spatial data foundations and institutionalizes them; Boosts their capacity to utilize information for evidence drive planning, and; Brokers the relationships between city governments and the private sector to leverage innovation in technology.

Municipal Spatial Data Infrastructure (MSDI) is the platform that facilitates the organization, sharing and utilization of geospatial information to tackle the challenges to achieve sustainable urban development. It is the cornerstone of any strategy for cities aspiring to embrace digital transformation and for the long-term success of smart city initiatives.

Clear action plans for MSDI operationalization i.e., **MSDI Roadmaps**, have been developed by CPL partner cities using a **four-pillar IPDS framework**. IPDS pillars correspond to **Institutional Arrangements** (local regulations and data governance protocols), **People** (competency frameworks and skill development), **Data** (collection, processing, management, utilization, and data driven tools), and **Systems** (Integrated Data Platform i.e., Geoportal).

This comprehensive IPDS framework enables **governance and regulatory innovations** to go hand in hand with technological solutions, and also takes into account the importance of human resources to strengthen data foundations. The IPDS framework is **agile, flexible, and scalable to cities with varying levels of capacity within Indonesia and globally**.

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"Governments retain a key role in ensuring that comprehensive and robust frameworks are put in place with related policies, resources and structures to ensure that geospatial information is easily accessible to decision makers in a coordinated way."

-United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM, 2015)

CPL- IPDS Framework:
The Institutional Arrangements Pillar

City of Balikpapan

OVERVIEW

Geospatial technology is helping governments to carry out data-driven planning, thereby optimizing limited land resources and connecting people to jobs and services. Cities across the globe are aspiring to become 'Smart Cities' by bringing digital intelligence to existing systems of urban service delivery. However, such technological and digital innovation cannot happen on its own- it needs an enabling institutional environment and committed leadership at the national and local levels for long term sustainability.

Clear and strong institutional arrangements and regulatory protocols for data governance are foundational to the implementation of Municipal Spatial Data Infrastructure (MSDI). Yet, this remains one of the biggest gaps in most cities across middle and low-income countries aspiring to leverage technological advancements.

The result is a lack of sustained inter-departmental data sharing initiatives and inadequate inter-agency coordination for urban planning. Further, weak protocols for data production and dissemination between departments exacerbates the problem of institutional silos.

CPL has undertaken an ecosystems approach to develop and operationalize a robust MSDI in partner cities through its holistic and implementable IPDS framework ▶

This document details the 'Institutional Arrangements' component of the IPDS framework and addresses the regulatory innovations and organizational structures required to adopt evidence-led planning in cities.

I
Institutional Arrangements

P
People

D
Data

S
Systems

Discussion on the IPDS Framework and Pillars

CPL conceives the institutionalization of MSDI-IPDS framework through a strategic MSDI roadmap, which provides multiple entry points for cities to implement a fully sustainable MSDI (see MSDI Booklet). This roadmap contains key components of the IPDS framework that need to be considered for data governance, including organizational structures, regulatory protocols.

Activities under the Institutional Arrangements pillar provide a collaborative platform for enhancing data governance and breaking down institutional siloes. It offers a "regulatory sandbox" of sorts, where regulations, protocols and procedures can be flexibly developed through inter-agency discussions, and implications of potential regulatory changes can be jointly tested and refined. Put into practice, this is a disruption of existing bottlenecks that prevent evidence - driven urban planning paradigms, allowing process and product innovations in a controlled environment under the supervision of local and national governments.

Situating the 'I' Pillar Within CPL's MSDI Approach

Institutional Arrangements refers to both the capacity of the city to develop and sustain policy, regulatory frameworks, and organizational structures that support geospatial-related activities, as well as the role of the city government in fostering the growth of the broader geospatial ecosystem.

Institutional Arrangements forms a critical component of the MSDI framework. Its mandate is to create an enabling regulatory environment that fosters data production, processing, use, dissemination, and sharing across multiple stakeholders including the public sector, private sector, and civil society. The institutional framework is aligned to maximize use of technology solutions that promote a shift toward integrated and strategic planning practices.

Effective Institutional Arrangements will ▶

CREATE A DECISION SUPPORT SYSTEM: proposed interventions help city governments to establish regulations and organizational structures for generating and sharing data on a continual basis. This serves as a decision-support system for city-wide spatial planning efforts while also addressing specific problems facing cities.

DEFINE ROLES AND RESPONSIBILITIES FOR KEY STAKEHOLDERS: this includes the scope of work and mandate for each stakeholder in the city government. Clear roles help to form structured interagency and intergovernmental arrangements and relationships of reporting within that. Each agency thus contributes to and is accountable for operationalizing a sustainable MSDI.

INSTITUTIONALIZE MSDI COORDINATION AND TECHNICAL WORKING GROUPS (TWG): representatives from line departments comprise the MSDI Working Group (MSDI TWG) to operationalize regulatory and governance frameworks, implement data standards, and oversee maintenance of geospatial policies.

FACILITATE DATA SHARING: this helps create agile organizational and regulatory structures which are guided by protocols for accelerating communication and data sharing. These protocols help avoid data duplication, and therefore economize time and costs.

FOSTER THE PRACTICE OF PRODUCING METADATA: this includes providing all government and non-government agencies with the same framework and template to produce metadata on a continual basis and allowing users to track when the data was created, its format, etc.

INSTITUTIONALIZE THE GEOPORTAL ADMINISTRATOR GROUP: an Administrator Group will facilitate the launch and management of the Geoportal (see Systems booklet), which is foundational to facilitating data sharing across government agencies and with the private sector as well as society at large.

PROVIDE STRATEGIC ORIENTATIONS TO DEVELOP FISCAL AND FINANCIAL MANAGEMENT CAPACITIES: this aspect ensures sustainability of MSDI at the municipal level.

ENABLE THE DEVELOPMENT OF DATA STANDARDS: Data standards provide spatial reference, and enable inter-operability of geospatial data and Urban Planning and Management Tools to enhance strategic planning and service delivery.

FOSTER CITIZEN AND PRIVATE SECTOR PARTNERSHIPS: between government, business enterprises, and the community, paving the way for effective service delivery.

CPL's Institutional Arrangements Toolkit

The CPL approach to formulating Institutional Arrangements involves three main activities; one, a Rapid MSDI Readiness Assessment and Deep-Dive MSDI Capacity Assessment and Geospatial Prioritization Survey of the city's geospatial readiness to adopt the MSDI; two, crafting a Data Governance Framework (including local regulations, protocols, ToRs for committees etc.) encompassing the elements of the MSDI Roadmap and three, developing detailed Organizational Structures with stakeholder buy-in to bolster the creation and operationalization of MSDI.

The Rapid MSDI Readiness Assessment and Deep-Dive MSDI Capacity Assessment carries out an elementary baseline assessment of a city's current state of geospatial implementation, and its challenges and requirements for future development. The Geospatial Prioritization Survey helps link an understanding of cities' current state of development and long-term goals and visions with recommendations for monitoring long-term progress of MSDI.

The MSDI Roadmap (see MSDI booklet) helps translate the IPDS framework into a set of actions structured within three time horizons. The Institutional Arrangements pillar uses the collaborative development of the MSDI Roadmap as its point of departure and solidifies it through the development of:

- local regulations, protocols, and service level agreements
- clearly established inter-agency roles and responsibilities
- identified data champions within key agencies

Key components to be considered for institutionalizing MSDIs as a framework generally include four fundamental sections: (a) articulating the overall MSDI strategy, (b) defining the IPDS framework as a foundation, (c) conceptualizing the operational plans for the MSDI framework, and (d) defining guiding principles for adherence to good practices. CPL emphasizes the importance of setting up Institutional Arrangements, which are key to operationalizing the MSDI. These are phased from short to medium-term milestones. Key activities to set up Institutional Arrangements across the four fundamental sections are ▶

CPL has drawn upon several international case studies to develop the Institutional Arrangements Toolkit. For instance, Singapore's SG SPACE serves as a benchmark for understanding the organizational structure for governing MSDI, along with examples of public facing (One Map) and internal geoportals (Geo Space). The City of Johannesburg's Corporate Geo Informatics Directorate has developed spatial data policy, protocols for data sharing and Terms of Reference (ToRs) for data champions who are accountable for sharing updated data to a central data repository. South Korea's National Integrated Information System (NIIS) achieves efficient integration of geospatial information across central and local governments. CPL's Institutional Arrangements toolkit includes two main components: one, data governance frameworks; which includes rregulatory protocols needed to operationalize the MSDI and two, organizational structures.

CPL has developed frameworks, guidelines and manuals for data governance and organizational structures that are agile and adaptable to cities of varying capacities, based on their own local governance structures, strengths, and challenges. These products, tools and templates can be utilized by any city government, regardless of city size or capacity. CPL team can offer additional guidance on how to develop these for interested stakeholders.

A Articulate Institutional Arrangements within the Overall MSDI Strategy

- Set vision and goals for MSDI
- Establish a technical committee for geospatial technology adoption and systems
- Delineate roles and responsibilities for line departments of the city government
- Formulate data governance frameworks with ToRs for all initiatives

B Conceptualize Institutional Arrangements in the I.P.D.S Framework

- As a foundational pillar, Institutional Arrangements also provide the necessary protocols to enable effective delivery of the P, D, and S components of MSDI
- Institutional Arrangements: formulate organizational structures, rregulatory protocols as key components of for data governance
- People: Develop an outline for competency framework and a fully implementable capacity building framework
- Data: Set definitions for data and metadata standards, fundamental data sets, data access, and data sharing
- Systems: Conceptualise data sharing protocols for operationalizing and maintaining Geoportal and urban planning tools

C Operationalize MSDI

- Conduct the Geospatial Prioritization Survey
- Develop an MSDI Roadmap - outline key tasks across short, medium and long-term horizons
- Phase key activities and enablers
- Set milestones
- Prepare an action plan for implementing MSDI
- Prepare plans for manpower resourcing and financial sustainability
- Track implementation through a Monitoring and Evaluation (M&E) framework

D Set Guiding Principles and Good Practices

- Create a framework for data and metadata standards (basic and advanced)
- Develop Fundamental Data Sets (FDS)
- Create data access framework (for the Geoportal and Urban Planning Tools)
- Establish principles and good practices for data sharing
- Formulate data management Standard Operating Procedures (collection of and request for data)
- Develop guidelines for data custodianship and ownership
- Set out data management guidelines (specific to the use of data, data privacy, and personal data management)

Data Governance Framework

Data governance used to be good-to-have, but not required. However, due to the increasing focus on data availability and analytics, it has now become a necessity that drives data management across the public and private sectors.

Thus, data governance is a key component of MSDI and provides a framework to ensure that organizations abide by the requirements and standards. As the amount of data increases exponentially, data inconsistencies are more pronounced and must be addressed as there is a risk of decisions being made using incorrect information. With data governance, data will flow across organizations and departments, enabling a common language for analysis and decision-making.

Establishing a robust data governance framework involves developing policies for data management including guidelines, regulatory protocols for how agencies will relate to one another within the local government's organization.

This includes:

- Laying out detailed workflow scenarios to establish communication protocols and relationships between line departments and a reporting structure within the city government's hierarchies.

- Formulating protocols for data sharing including criteria for data access, standards for data formats, legal obligations, privacy, and data security outcomes.

- Establishing Standard Operating Procedures for data management. This helps city governments streamline the process of managing Geoportals, which consist of numerous datasets that span multiple thematic categories. The local government's decree on data governance includes all components of the data governance framework.

Regulatory Protocols

Regulatory protocols are key components of the data governance framework. The regulatory framework for operationalizing the MSDI includes clear guidelines on how to approach the development and implementation of MSDI at the city level and forms a vital aspect of mobilizing Institutional Arrangements.

This includes establishing guidelines, standards and protocols for:

- Communication across working groups related to MSDI for better coordination between line departments on data management
- Production, processing and administration of data and metadata standards to enable inter-operability of data across departments and organizations
- Data custodianship, data access, and data sharing, including defining authority and roles of data contributors and users.

CPL's suite of regulatory protocols for data governance are robust tools that equip city governments to embrace digital transformation. ▶

Sample local government decrees for data governance, for medium sized cities with varying capacities are available with the CPL team. These encompass policies, guidelines, regulatory protocols and illustrate the process entailed in developing them.

Organizational Structure

The MSDI's organizational structure consists of coordinators, technical committees, and working groups to execute tasks aligned with the MSDI framework. The MSDI Coordinator is responsible for obtaining agreements from all line departments to operationalize MSDI's regulatory and governance framework. The MSDI Coordinator reports to the mayor, and works with various working groups to implement data

standards and access, secure budget, resources and monitor the progress of activities.

The MSDI Technical Working Groups (TWGs) are led by the City Planning Agency. TWGs oversee the operationalization of MSDI, resource allocation, launch of the Geoportal and a multi-year capacity building program. Members include representatives from the developmental, planning, environmental, security, statistical, healthcare and economic agencies.

Departmental "Data Champions" are given the responsibility to draft regulations for Data Standards and Management and develop an action plan for implementing MSDI within their departments.

The MSDI working groups also establish issue or opportunity-based GeoCommunities, which serve as forums to convene experts across agencies and institutions to develop geospatial solutions for a pressing city issue or opportunity (see People booklet). As agile groups that respond to immediate needs, GeoCommunities help cities scope their priority activities within the MSDI roadmap.
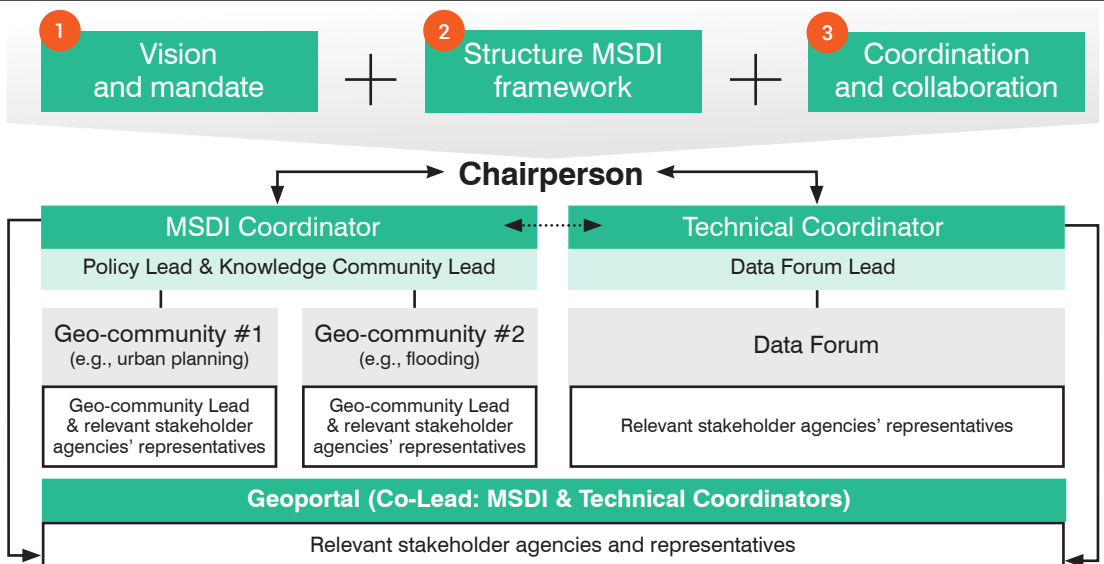
MSDI comprises of a complex set of inter-agency and inter-governmental arrangements. This multi-faceted web of relationships enables creative interaction among sectors and collaborative development of new products, approaches, and technologies. However, the complex nature of MSDI also poses challenges to effective coordination and governance. CPL offers guidance to city governments on delineating roles and responsibilities by setting out the scope of work and mandate for each line department of the city government.

The MSDI organogram shows the working relations between various working groups of the MSDI and situates them within the hierarchical structure of the city government. CPL has also developed multiple workflow scenarios to help agencies within cities to easily situate themselves within the MSDI organogram. These include workflows for MSDI coordinators, working groups, GeoCommunities, data contributors and users.

Introducing real change requires that institutional and regulatory solutions accompany technological solutions. Together, these solutions instigate structural disruptions to urban data governance processes. Realizing the Institutional Arrangements of MSDI's IPDS framework will shift decision-making processes toward an evidence-led spatial planning paradigm.

MSDI ORGANOGRAM: EXAMPLE OF RECOMMENDED ROLES AND RESPONSIBILITIES FOR CITY GOVERNMENTS

1 Vision and mandate + 2 Structure MSDI framework + 3 Coordination and collaboration

Chairperson

MSDI Coordinator	Technical Coordinator
Policy Lead & Knowledge Community Lead	Data Forum Lead

Geo-community #1 (e.g., urban planning)	Geo-community #2 (e.g., flooding)	Data Forum
Geo-community Lead & relevant stakeholder agencies' representatives	Geo-community Lead & relevant stakeholder agencies' representatives	Relevant stakeholder agencies' representatives

Geoportal (Co-Lead: MSDI & Technical Coordinators)

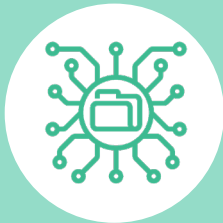Relevant stakeholder agencies and representatives

CPL Data Governance Product List

Spatial Information Policy: A Framework for Standards, Regulations and Protocols

Guidelines and template that define all MSDI components for which regulations are required

A guide for city governments on creating Standards, Policies and Procedures for MSDI that orients city governments on regulatory conditions needed for the use and management of spatial information for cities. This policy framework provides principles for city governments to establish organizational structures and regulatory protocols to realize an MSDI that suits their needs.

Data Access Framework

Criteria for defining data access and methodology for consensus building across line departments of the city government

A guide for line departments of city governments to classify datasets and respond to data requests such as channels for dissemination of open data or restricted data. It also includes data protection and security measures applied to each data classification level and sets the base for city governments to formulate protocols for data sharing.

Protocols for Data Sharing

Communication protocols and scenarios of communication between stakeholders of the city and the MSDI organizational structure for data sharing

A manual for establishing communication protocols for data sharing. It draws upon the Data Access framework and outlines coordination and communication protocols for agencies contributing data, requesting data and accessing data from the Geoportal. formulate protocols for data sharing.
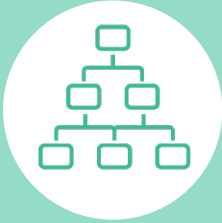
Standard Operating Procedures (SOP) for Data Management

Series of coordination protocols for data production, collection, processing, and dissemination

These SOPs are a guide for city line departments on procedures for effective data management, covering the entire life-cycle of datasets, including obtaining and capturing spatial data, data production, updating spatial data, processing data, and dissemination and sharing of data.

CPL Organizational Structure Product List

CPL's MSDI organizational toolkit includes organizational framework, roles and responsibilities, as well as protocols for their effective execution. Benchmarks pertaining to the MSDI organogram, the rationale for its design, sample roles and responsibilities, and workflow protocols are all available with the CPL team.

Organizational Framework
MSDI organogram supported by rationale and administrative action needed for setting up the MSDI organizational structure

A guidance note for city governments to establish an organizational structure for implementing MSDI, including a brief outline of committees and working groups that need to be created and roles and responsibilities assigned to them to execute tasks that are aligned with the MSDI framework

Roles and Responsibilities Guide
Detailed Roles and Responsibility statements for all key stakeholders

Guidelines for defining roles, responsibilities, and clear scope of work of key stakeholders responsible for the various initiatives of MSDI. The framework helps line departments avoid potential duplication or oversight of work that is required while emphasizing the importance of joint responsibilty of all stakeholders for effective implementation of MSDI

Protocols for Inter-Departmental Coordination
Inter-departmental communication protocols for tasks initiated by MSDI coordinator, technical lead, geoportal lead, data contributors, data users

Workflow scenarios aligned with the organizational structure and roles and responsibilities show how the different MSDI working groups relate to one another and are situated within the larger hierarchy of the city government

These products have been developed by CPL and are available for use by any interested stakeholders.