

3.02 People (GIS Advocacy and Skills Development)

When a municipality is getting started in GIS, the initiative should come from within the organization. The LGU management should know its own organization well enough to be able to make it more efficient in delivering the services that the local constituents expect of it. And in order to maintain its organizational efficiency, the LGU's GIS staff should initially consist of people who are already in the organization. If a new employee can be hired, he/she should bring technical knowledge and experience. Otherwise, those existing employees, such as a draftsman for example, can be trained. The LGU management can encourage them into the shift by giving a supportive and positive attitude. In a municipality, the GIS staff may have primary job responsibilities in other areas of concern. Since GIS is an add-on to the employees' existing duties, the LGU management must be sure there is enough time to give each activity its due.

To give proper attention to the GIS, some other work responsibilities of the staff must be lessened or altogether cleared, especially if the employee managing the GIS operation has other responsibilities. Some of the current employees may apply for GIS positions and they should be considered based on their existing knowledge and ability to be trained for the position. The key is to have a team of people who have knowledge of both the organization and GIS.

Training for existing staff that will be part of the GIS Team can focus on technical matters while training for newly-hired staff should also include, aside from the technical matters, training on how the organization operates. It is important for the GIS staff to understand the existing operation of the organization in order to enhance the use of the GIS to its fullest.

3.02.01 Advocacy for a Municipal GIS with Elected Officials and LGU Management

Phases

To ensure success of the GIS, the commitment of the LGU management must be total. It should be demonstrated by putting this commitment into concrete actions that will have to be sustained throughout the operation of the GIS.

To get GIS as a tool for everybody within the organization is a process that can take place in a span of at least five to ten years. The whole process can be viewed as a project with four phases.

Phase One can be called ‘the convincing phase,’ whose purpose is to get the politicians and the top management convinced about the benefits of implementing a GIS for the municipal (spatial) planning activities such as the revision of the CLUP.

Phase Two is ‘the inventory phase,’ with the objective of finding out the capacity of the LGU (or the internal ‘state of the art’), what’s going on in the surrounding world, where to utilize lessons learned, and who are the prospective members in the project team.

Phase Three is ‘the design phase,’ where the project team is established, the important initial data sets (both available within the LGU organization and outside it) have been identified and acquired, and a viewer GIS is being installed within the organization. In this phase a requirement specification for ‘corporate’ GIS (how the data can be shared by the stakeholders) and for a metadata base are completed.




Phase Four is ‘the implementation phase,’ wherein the development of the corporate GIS is made and the GIS applications implemented. The provision of data to users is on-going, the knowledge enhancement plan is implemented and the GIS network is up and running. In this phase additional data sets for installation on the GIS server are decided and new requirements on GIS functionality are recorded for a future development project.

In order to succeed with the fourth phase of implementing GIS it is absolutely necessary to get through, and achieve good results from, the first three phases.

Below are some issues that have to be considered during the process:

Analyze and Discuss the Benefits of GIS

The core questions in discussing the benefits of GIS are:

-  How can the use of GIS contribute to the LGU management?
-  What are the prerequisites for increasing the internal efficiency within the organization?
-  How can decision-making be supported by GIS?

Chapter 2 includes plenty of justifications which can feed these discussions.

Incorporate GIS into the IT strategy

The introduction of GIS requires a clear commitment and the active involvement of the entire LGU organization in order to succeed. The initial step is to establish the GIS strategy and incorporate it in the Information System Strategic Plan of the LGU.

Training Needs Assessment and Skills Enhancement

An important component of the action plan is to find out the needs for education and training. Based on the training needs assessment, a GIS Knowledge Enhancement Plan (KEP) should be formulated. It is important to determine the training needs of the staff that will comprise the GIS core team. The HLURB Regional Offices will assist in the building of the basic capacity of LGUs, and the intention is to develop a training facility at HLURB that will provide applied GIS CLUP training.

Create a GIS Network

The team leader – a ‘Geographic Information Officer’ (GIO) needs to be appointed, who will network with other colleagues in the different offices within the LGU organization. It would be advantageous if these colleagues have the same skill as the GIO in order to have a strong internal GIS organization.

A separate training program is normally necessary for the members of the GIS network. A low-income municipality with low computer proficiency may not be able to appoint a GIO, in which case the MPDC, or a knowledgeable person from the LGU organization may be assigned the task of GIO.

Accomplish Activity and Information Need Analysis Processes

Another initial activity in the GIS implementation is the analysis of the processes concerning the needs for and current uses of geographic data, and the requirement for GIS software. This should enable the LGU management to make the right decision for data management, the procurement of a suitable GIS software, and efficient access to needed data.

Information within the Organization

At the outset, it is important to establish what internal information is available, the quality of such information, and to analyze the information needs of identified target groups within the organization.

Ensure Immediate Access to Software and Data

GIS software and local basic data sets must be available for use prior to training of staff. It is also important to give the trainees the opportunity to start working with GIS directly after training.

3.02.02 Management, Institutional and Organizational Issues in the Development of a Municipal GIS (Action) Plan for the Introduction of an LGU GIS

Implementation of GIS should be the result of a strategic decision by the LGU management, and emanating from the IT or GIS Strategy (if such is available). Development of the GIS system should proceed on the basis of the organization’s information needs and the availability of geographic data. A step by step process should be followed, beginning with the use of simple applications which are needed by the various users in their daily work, and progressing to more advanced and complex user applications. Using GIS for CLUP preparation is one application that starts from simple tasks and can grow into a more sophisticated use of the tool.

The Geographic Information Officer Has a Key Role

The GIO must be a good project manager and negotiator; he must be diplomatic; and, he must be very familiar with the business. It is not enough that he is highly proficient with GIS. And the GIS team that supports the GIO should operate as a cohesive GIS

human network, with skills corresponding to that of the GIO. This is the way of establishing a robust GIS organization.

Plan Carefully for the GIS Implementation

The first task is the formulation of an implementation plan based on the results of a survey of information needs for the different business activities. Chapter 4.02.01 in the Toolbox presents an example of an implementation strategy for using GIS in CLUP preparation.

Availability of Data – A True Success Factor

An important factor in GIS implementation is the availability of relevant data. It is therefore necessary to evaluate existing data sources prior to formulating the implementation plan. Chapter 6.02 includes a form that outlines the steps in finding out the current status of available attribute and spatial data needed for the CLUP preparation. Likewise, Chapter 5 of the Toolbox gives more details on the attribute tables that need to be compiled.

The implementation of GIS is facilitated if the staff already has knowledge about how non-spatial databases are designed and how to work with the attribute datasets in Excel. Implementing GIS and training the staff (including the end users) must be done in parallel to ensure success.

It is important to have the trained end users work with GIS soon after the training in order to keep the momentum of work and the knowledge fresh, and the enthusiasm to work with the new tools is still high.

Common Functionality and Activity-Specific Applications

“Common GIS functionality” refers to a centrally implemented GIS that is simultaneously available and or accessible to all users.

“Activity-specific applications” however, are developed for a specific branch or service or group of users. Development of such applications should be the responsibility of the specific office concerned. These applications have to be compliant with standards and structures that are applicable for the entire organization.

The CLUP GIS can perform these operations of common GIS functionality and activity-specific applications, and this versatility will enable users within the organization to freely use and exchange data for use in other applications. *Chapter 4.18 gives examples on the multi usage quality of a versatile geographic information system.*




3.02.03 Preparation of a (CLUP) GIS Training Program for LGU Staff

One of the causes of poor and unproductive use of GIS is the lack of training for the people who are supposed to operate the tools related to the system. If users don't know how to address spatial problems and use the computer to find the geographical answers, they won't





be able to know how to apply GIS. It is important, therefore, to assess training needs and options.

One of the most important factors for successful GIS implementation is the availability of trained staff. Efficient staffing and appropriate training must be part of the GIS implementation strategy. Some of the conditions that can help retain staff are:

-  interesting and challenging tasks
-  supportive management environment
-  continuing opportunities for staff development (attendance to GIS-related seminars, contact with other GIS professionals, etc.)

There are two main staff groups who are expected to work directly with the GIS system:

-  **GIS primary users** consisting of the planners and / or the planning team involved in the CLUP preparation
-  **GIS end users** consisting of staff that will use the results of the CLUP preparation process such as the sector data, land-use plan, ZO; etc. in their daily work

Geographic Information Officer



The 'Geographic Information Officer' (GIO) who will manage the CLUP GIS application will have to be appointed at the outset and be given sufficient training. He should be competent in general management as well as GIS. The GIO's proficiency in managing people, information, priorities, and time will contribute to the success of GIS implementation. Management seminars provide opportunities for enhancing such proficiency, by listening to experts and by interacting with others in similar positions. Courses designed to help in specific subjects such as general management skills, project management, strategic management, and total quality management, will all be helpful to the GIO.

For low-income municipalities, the MPDC will most likely fit the role of GIO. However, if there are opportunities or other projects for strengthening the LGU's IT capacity, and there is an available full time competent staff person with knowledge in implementation of computerization strategies, then that person can be designated as GIO.

For a low-income municipality where the CLUP GIS is one of the first computerized applications, there is a training program included in the Toolbox, Chapter 7.01.

Introductory trainings for advocacy purposes should also be conducted for the LGU officials and the LGU top and middle level management.

GIS Primary Users



The primary users comprise the staff that is responsible for creating, maintaining, and operating both the data and the system infrastructure. Defining the common ground for information, such as agreeing on a

uniform metadata base and entry of data into databases plus capacity building and training, are important matters that need to be dealt with at the start. The primary users will require regular refresher courses to keep them updated on current and new techniques and methods.

In addition to the GIS staff, training for system administration staff (network administrator, database administrator, and hardware technicians) must be considered by those larger cities / municipalities that can afford to mobilize these positions.

In the CLUP GIS preparation it is recommended that the respective sectoral offices are made responsible for sector data capture and maintenance. These sectoral offices will need custodians who will monitor the maintenance of the sector database and give support to the end users regarding CLUP project studies, data maintenance, and map production.

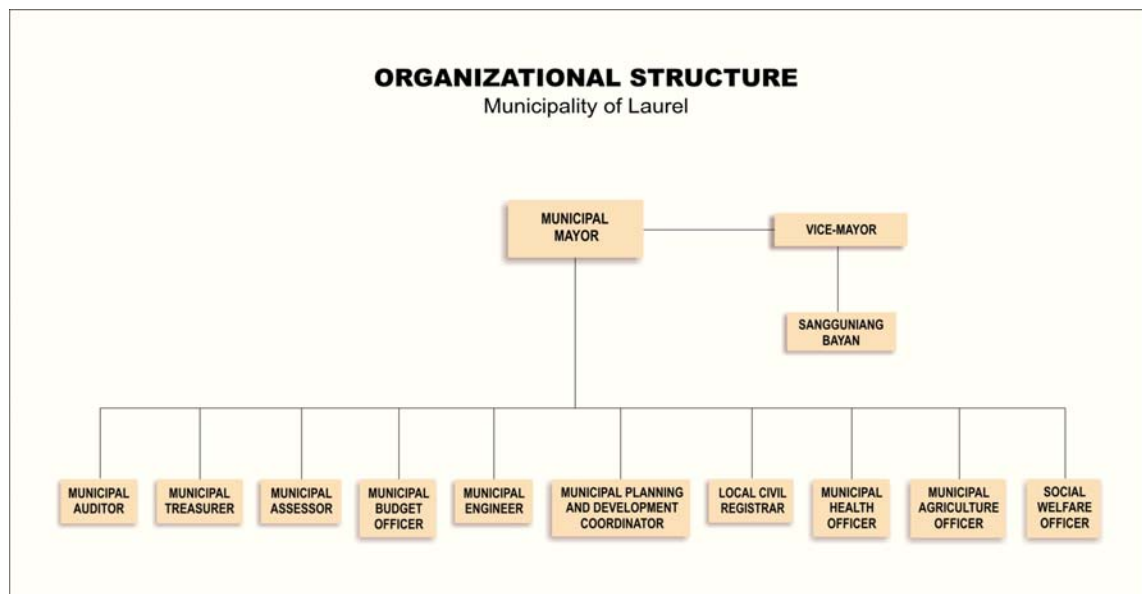
GIS End Users



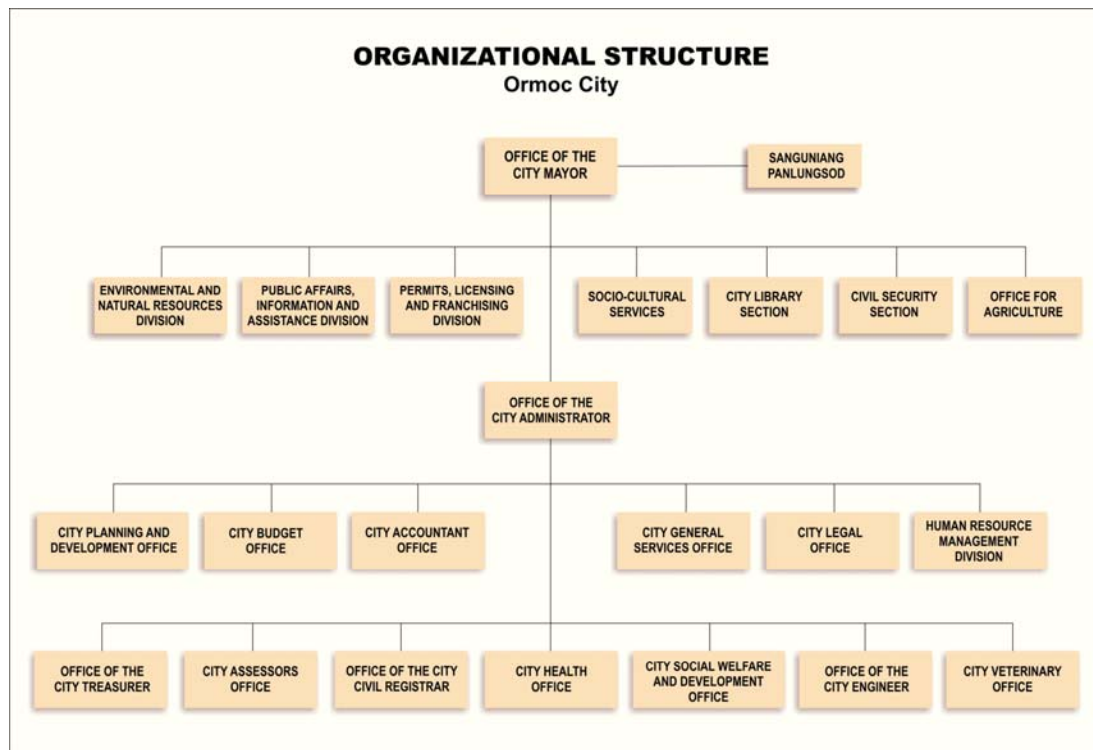
The prospective user of a GIS must be confident with analyzing and manipulating attribute data in order to be receptive to learning about GIS. GIS end users need training in the software and applications with which they will be working. GIS is inherently a multi-disciplinary science and attention should also be given to training in other areas where the technology will complement the work that users do every day.



Introductory trainings for advocacy purposes should also be conducted for the LGU officials and the LGU top and middle level management.

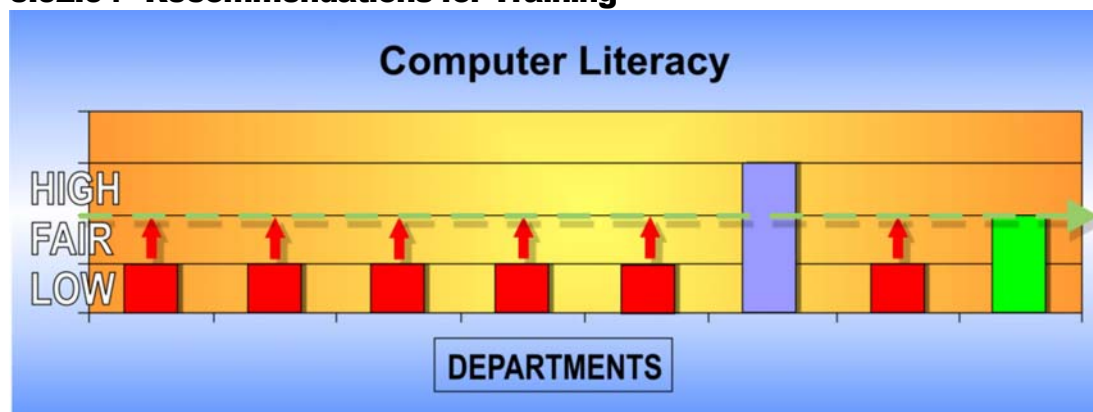


Organizational Chart for Laurel



Example of an Organizational Chart for a City

3.02.04 Recommendations for Training



Database management in LGUs varies from the traditional analogue (paper based) system to secured digital operations. Generally, a minority of the workforce involved in database management has achieved a computer awareness level where only MS Office Word and Excel software are being mastered. One objective in general training for the LGU should be the elimination of disparities among the various LGU offices and reach a level where everyone 'speaks the same language.' The training program should consist of a step-by-step process allowing all the prospective trainees to be given a general introductory training in GIS, while providing opportunities for specific trainings to produce local expertise in attribute and spatial database management.

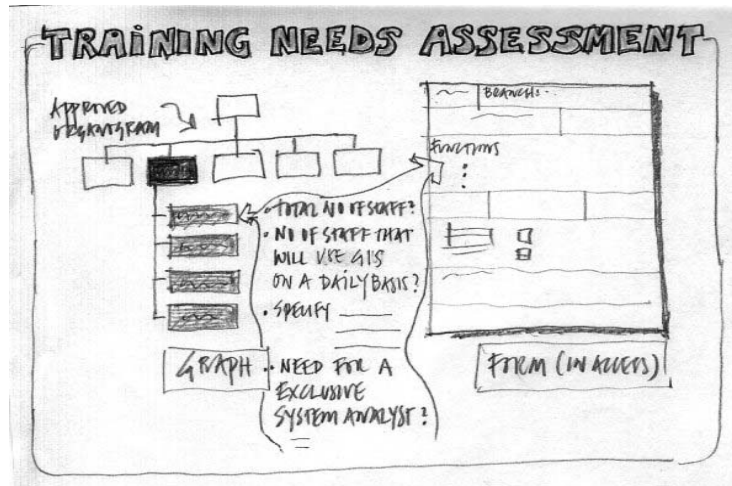
During the learning process it is very important that the trainees have data from their own offices to practice with.

In the preparation of the GIS Cookbook, two training modules (**Basic GIS training and Applied GIS training**) have been prepared to give support to 'non-computer literate' staff that will be involved in the CLUP preparation using GIS.

GIS Staff Computer Literacy and GIS Training Needs Assessment

When the GIS team has been organized and mobilized, a training needs assessment should be conducted which will be presented in a KEP (Knowledge Enhancement Program).

The number of GIS users that will browse geographic information on a daily basis should be determined. The number of GIS primary users who will give support to the respective offices regarding GIS project studies, data maintenance, and map production should also be determined.



After the training needs assessment has been conducted, the number of staff that need GIS training can be established. However, at least two persons in each office must have sufficient skills to manage the sector (attribute) databases. During the implementation phase, more work staff will be needed to populate the datasets.

3.02.05 Training for Using GIS as a Tool in CLUP Preparation

HLURB has prepared a training package for municipal planners who are literate in MS Office but have no previous experience of GIS software:

Module 1, (one week) Basic Computer Training and Introduction to Digital Database Management

The new application is presented and the rationales for a digital database are given. There is also a beginner or review component for word-processing and data entry into spreadsheet and prepared forms. The participants will bring information about their job activities and there will be practical exercises on how to fill the forms, etc. It will also give an introduction to GIS, which will give the participants an understanding of what a GIS is, what it is intended for and how it is structured. The module also includes basic knowledge about hardware and trouble-shooting.

Module 2, (one week) Applied CLUP Database Management Training

This module is intended for GIS primary users who will be managing a sector database. It should enable the trainees to be competent with database building and management. The participants will use real data from their own sector and the

outcome of the training will be a set of databases included in the CLUP sector database. It also includes an introduction to GIS, which will give the participants an understanding of what a GIS is, how it can be used and how it is structured. At the end of the course participants will have a working knowledge of the concepts, terminology and tools used to create and manage integrated mapping data in a local government environment with special reference to the CLUP.

The CLUP GIS training modules and programs are found in the Toolbox, Chapter 7.01.

Specialist Training





For special trainings that may be required by the more specialized GIS staff such as the GIS Software Expert and GIS Database Analyst, as well as the system administrators such as the Computer System Manager, Network Administrator, Database Administrator and Hardware Technicians, the best option is to find suitable advanced training opportunities in the private market. Such special trainings however will not be applicable to the GIS Cookbook's target group of municipalities.

Advocacy and Applied Training

This module is intended for Municipal/City Councilors, LGU top and middle management officers, who will not directly work with the GIS system, but need to know how GIS can assist in decision-making, and the requirements for a sustained GIS. The GIS Cookbook provides guidelines (see for example Chapter 2) for advocacy which can be used for raising awareness among the local officials and LGU senior management, about the advantages of a GIS

3.02.06 GIS Training Opportunities

Current training opportunities for learning GIS in the country may be available at the following:

-  University of Philippines which offers undergraduate and postgraduate courses in Geodesy. These courses are primarily intended for students who want to specialize in GIS and Remote Sensing.
-  Geodata which is the country's authorized distributor of ESRI software (such as ArcView, ArcGIS, etc.) offers basic and advanced short-term trainings on how to manage the software. However, their exercises are based on refined and very accurate data from the USA, which is not reflective of the situation in the Philippines.
-  NAMRIA has a computer laboratory and offers short-term trainings customized to the Philippine environment. The agency has conducted on-demand courses targeted for national agencies and LGUs
-  HLURB, as mentioned above, will provide on-demand training on how to use GIS as a tool in CLUP preparation. It will be conducted for municipalities that are in the pipeline to update their CLUPs.






For more information, please refer to Toolbox, Chapter 7.

3.02.07 Some Recommendations for External Technical Assistance in CLUP Preparation

The HLURB Regional Offices extend technical assistance in the preparation of the CLUP. Nowadays however, LGUs also engage the services of consultants in the preparation of their CLUPs. The HLURB CLUP Guidelines are meant to encourage LGUs to take the lead in the planning activities, with technical assistance from technical experts as needed. The GIS Cookbook provides guidelines for preparing the Terms of Reference for the hiring of technical experts in CLUP preparation using GIS.

General Recommendations

The following recommendations are given for the procurement of technical expertise to assist in the GIS development activities of the LGU. They can be included in the Terms of Reference for the technical expert's activities, and incorporated in the MoA between the LGU and HLURB or in the contract between the LGU and the private consultant for the CLUP preparation:

-  The technical expert shall use the same software environment as the LGU (in HLURB's case, it is Arc View 9). All end products of the technical expert's work should be delivered in shape files in a digital format;
-  Upon completion of the technical expert's work, all attribute and spatial data, micros, applications, etc., are turned over to, and become property of the LGU, and can be freely manipulated by the LGU. All outputs of the consultancy work such as, but not limited to, digital data, survey data, statistical data, etc. shall be turned over to the LGU;
-  The LGU shall be the primary distributor of all data produced under the consultancy;
-  The end products, such as data, micros, applications, etc., cannot be sold by the technical expert to a third party without the consent of the LGU;
-  On the job training should always be provided, with the objective that the assigned LGU staff will acquire or enhance their capability to manage, make revisions and updates of the CLUP after completion of the technical expert's contract.

Please refer to Chapter 4.04 in the Toolbox for more details regarding what should be considered in a ToR and included in a MoA for CLUP preparation using GIS.