Approaches to Determine and Represent Geographical Units Including Geocoding, for Statistics:
Philippine Experience

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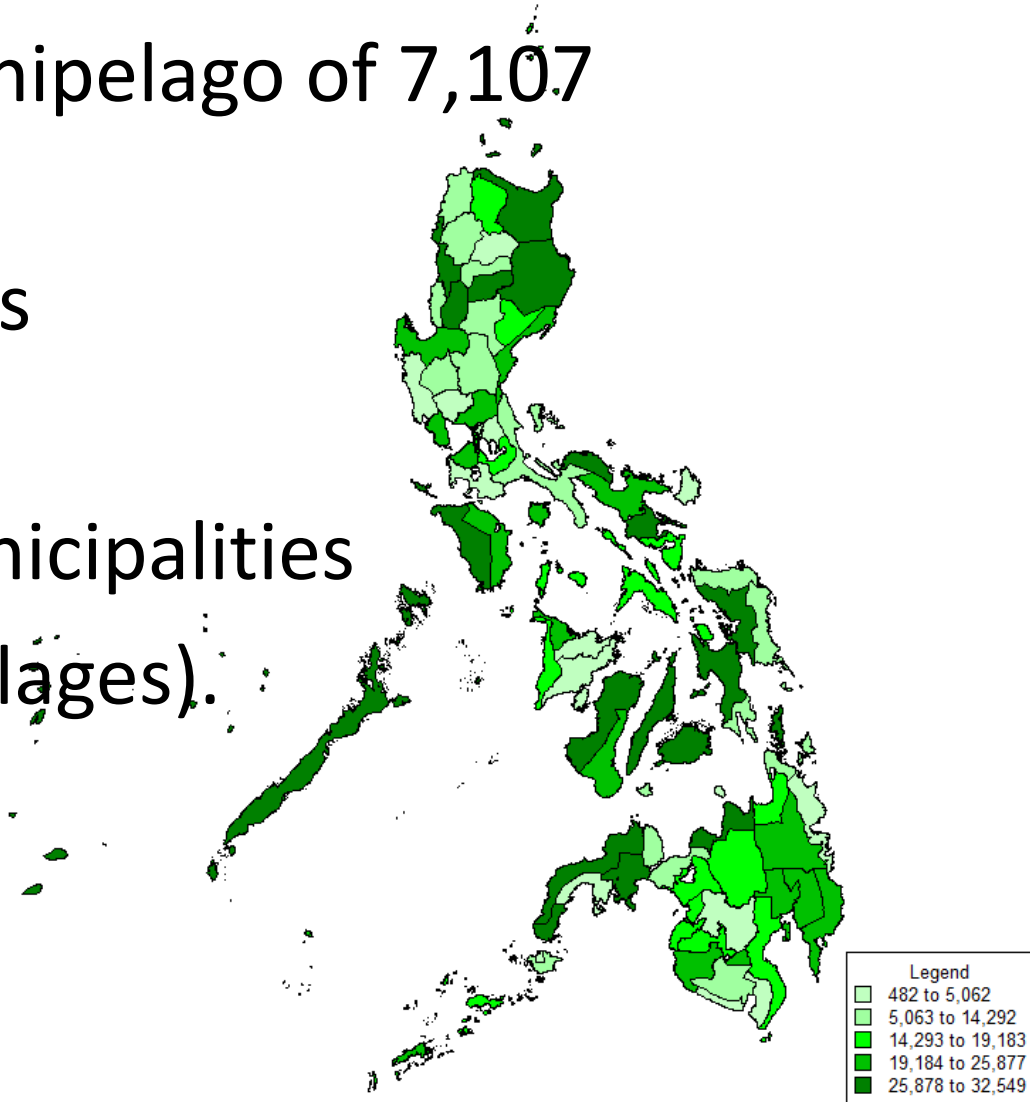**Philippine Statistics Authority**
9 June 2014

Agenda

- Introduction
- Use of Philippine Standard Geographic Code in Generation of Statistics
- Use of Digitized Maps in Delineation and Enumeration
- Sharing Map Shapefiles Holdings and Geography-based Statistics
- Future Directions

2

Introduction

- The Philippines is an archipelago of 7,107 islands

- 17 administrative regions

- 81 provinces

- 144 cities and 1,490 municipalities

- 42,028 *barangays* (or villages).

Legend
- 482 to 5,062
- 5,063 to 14,292
- 14,293 to 19,183
- 19,184 to 25,877
- 25,878 to 32,549

3

Use of Philippine Standard Geographic Code in Generation of Statistics

- PSA generates statistics for all levels of administrative areas using the Philippine Standard Geographic Code (PSGC) to uniquely identify each of the geographic units

- As a policy, the PSGC is used as common standard in coding geographic units in all censuses and surveys.


PSGC INTERACTIVE
Philippine Standard Geographic Code

▶ **Region: REGION VIII (Eastern Visayas)**

Code	080000000
Registered Voters (2010)	2,431,584
Population (as of May 1, 2010):	4,101,322

Number of provinces	6	No. of Cities	7	Number of municipalities	136

PROVINCES

Province	Code	Income Class	Info	Vo
BILIRAN	087800000	4th Class	8 Mun. 132 Bgys	
EASTERN SAMAR	082600000	2nd Class	22 Mun. 1 City 597 Bgys	
LEYTE	083700000	1st Class	40 Mun. 3 Cities 1,641 Bgys	
NORTHERN SAMAR	084800000	2nd Class	24 Mun. 569 Bgys	
SAMAR (WESTERN SAMAR)	086000000	1st Class	24 Mun. 2 Cities 951 Bgys	

4

Use of Philippine Standard Geographic Code in Generation of Statistics

- The Philippine Standard Geographic Code (PSGC) is a systematic classification and coding of geographic areas of the Philippines

- Based on the 4 hierarchical levels of geographical-political subdivisions of the country such as the administrative region, the province, the municipality/city and the barangay
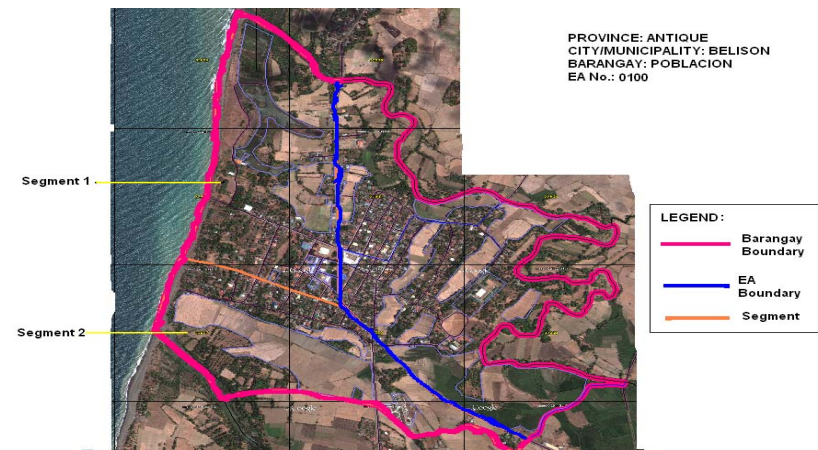
Barangay

Municipality/ City

Province

Region

5
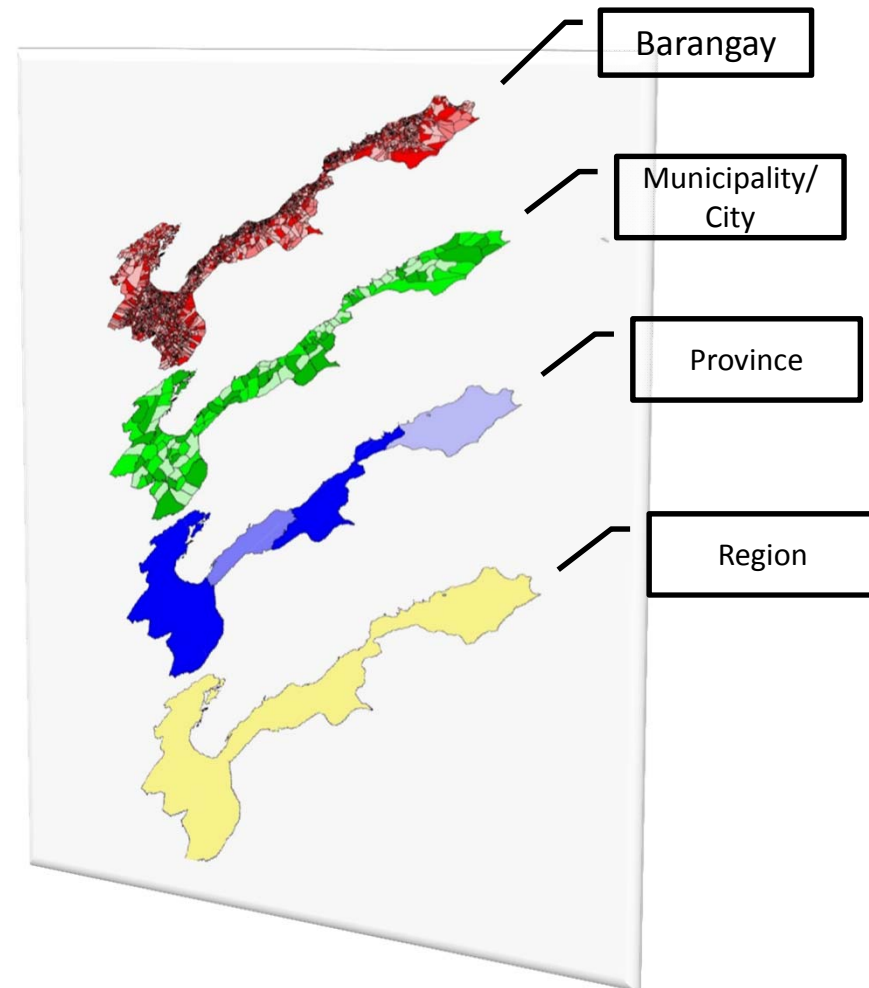
Use of Philippine Standard Geographic Code in Generation of Statistics

- The PSGC is a product of an inter-agency Technical Working Group (TWG) on Geographic Classification led by the National Statistical Coordination Board (NSCB)

- Members of the TWG include:
  - Commission on Elections (COMELEC)
  - Department of the Interior and
    Local Government (DILG)
  - National Statistics Office (NSO)
  - National Computer Center (NCC)
  - National Mapping and Resource
    Information Administration (NAMRIA)
  - Department of Budget and Management (DBM)
  - National Statistical Coordination Board (NSCB)

6
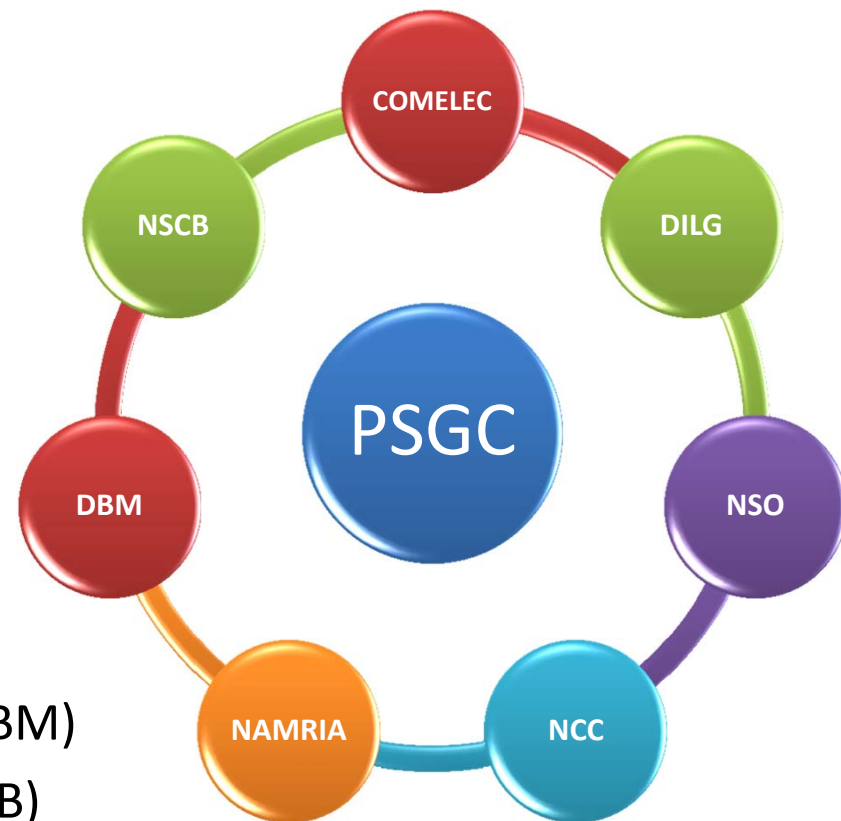
Use of Digitized Maps in Delineation and Enumeration

- Digitized EA maps are used in area delineation and enumeration

- EA maps are used to ensure completeness of coverage and to avoid overlaps during censuses or surveys

- Field personnel identify permanent features of the area such as rivers, streets, *barangay* roads, national roads and landmarks that may serve as boundaries of the enumeration area or *barangay*.

- The boundaries are then indicated on the EA maps printed from GIS shapefiles. Usually the printed EA maps are overlaid with Google maps to ensure proper identification of boundaries.
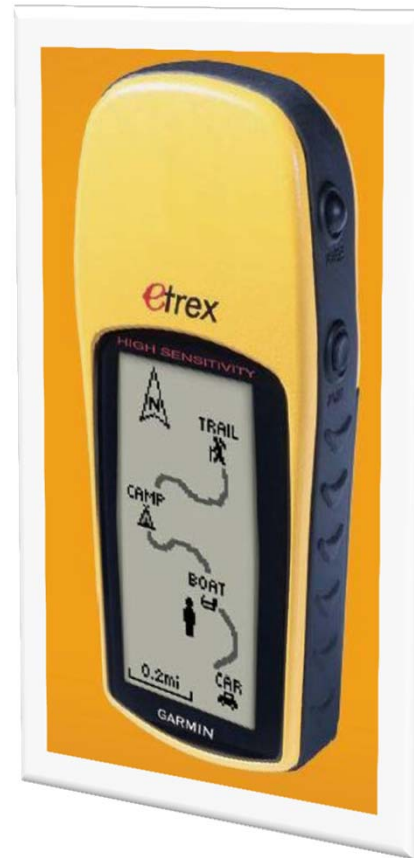
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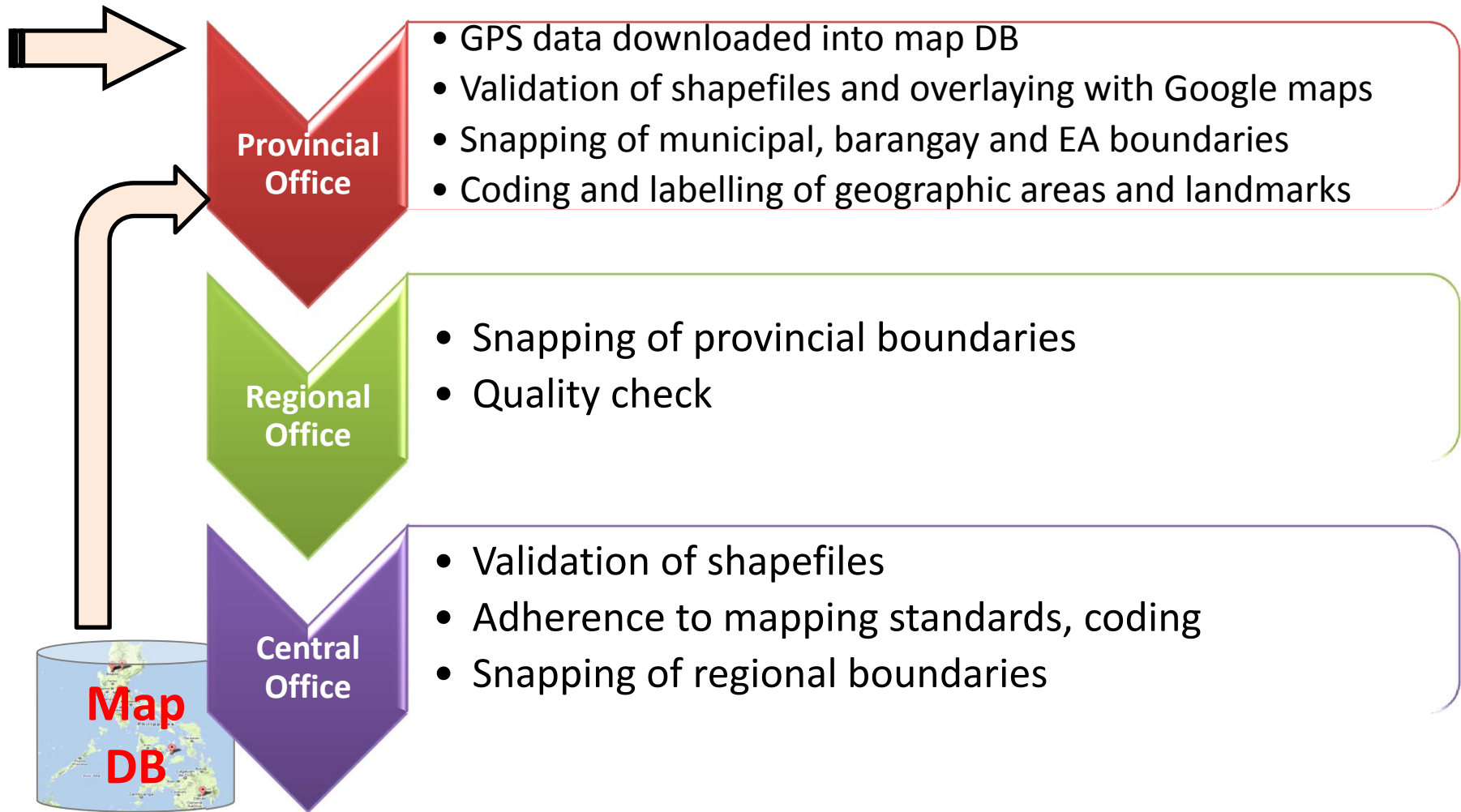# Use of Digitized Maps in Delineation and Enumeration

<u>Nationwide Mapping Using GPS</u>

- **Pilot mapping operation** was undertaken for the **2010 CPH** to ensure accurate boundary maps covering *barangays* (or villages) with 2 or more EAs or highly populated areas in 5 regions

- Key field personnel underwent training on census mapping using GPS.

- Equipped with GPS units, field staff went around most of the geographical units to verify and plot boundaries, rivers, roads and landmarks.

Use of Digitized Maps in Delineation and Enumeration

Provincial Office
- GPS data downloaded into map DB
- Validation of shapefiles and overlaying with Google maps
- Snapping of municipal, barangay and EA boundaries
- Coding and labelling of geographic areas and landmarks

Regional Office
- Snapping of provincial boundaries
- Quality check

Central Office
- Validation of shapefiles
- Adherence to mapping standards, coding
- Snapping of regional boundaries

Map DB

9

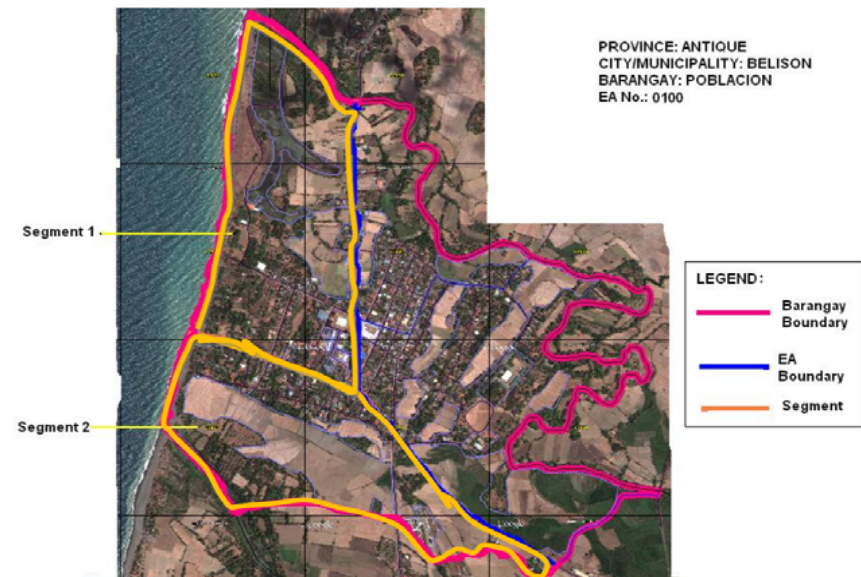# Use of Digitized Maps in Delineation and Enumeration

- A **nationwide mapping** of area boundaries was undertaken during mapping activities for **2012 Census of Agriculture and Fisheries** (CAF)

- Mapping of areas with no digital maps were also undertaken using GPS units

- For the **2015 Mid-Decade Census of Population**, the PSA is currently conducting **EA delineation operation and updating of digitized maps**.

- With updated digitized maps, the PSA expects that all areas will be enumerated completely and accurately

10

Use of Digitized Maps in Delineation and Enumeration

Use of Map Shapefiles in the Development of Master Sample Frame

- Use of digitized maps, Google Earth maps and 2010 census block maps facilitates the development of PSU formation guidelines for the development of new master sample

- The overlaid digitized maps help identify the natural boundaries such as rivers, roads or street patterns, and known land marks in the area, results into a clearer and non-overlapping segment boundaries

Figure5a. An Illustration of Segmented Large EA using digitized Satellite Image

PROVINCE: ANTIQUE
CITY/MUNICIPALITY: BELISON
BARANGAY: POBLACION
EA No.: 0100

Segment 1

Segment 2

LEGEND:
- Barangay Boundary
- EA Boundary
- Segment

11

Use of Digitized Maps in Delineation and Enumeration

<u>Use of Map Shapefiles in the Development of Master Sample Frame</u>

- Clusters of roofs help in determining the presence of residents, community, and villages.

- This information could vastly improve the quality of new master sample frame for household-based surveys.

12

Sharing Map Shapefiles Holdings and Geography-based Statistics

- PSA shared its map shapefiles holdings and geography-based statistics with other government agencies, NGOs, and researchers
- This is to encourage use of statistics in planning and research

Sharing Map Shapefiles Holdings and Geography-based Statistics

- Users of PSA digitized maps include:
  - Department of Science and Technology's Project NOAH for their Disaster Management Using WebGIS
  - NGO to assist mothers in setting up household-based stores in communities in selected provinces
  - National Mapping and Resource Information Authority (NAMRIA) acquired *Barangay* boundary shapefiles
  - National Economic Development Authority (NEDA)
  - National Anti-Poverty Commission (NAPC)
  - Department of Health (DOH)

Sharing Map Shapefiles Holdings and Geography-based Statistics

- The PSA also conducted workshops for municipal planning officers and regional statisticians on how to include data from 2010 CPH microdata into thematic maps using CSPro. The workshops equipped them with tools to present accurate profiles of their municipalities and regions.
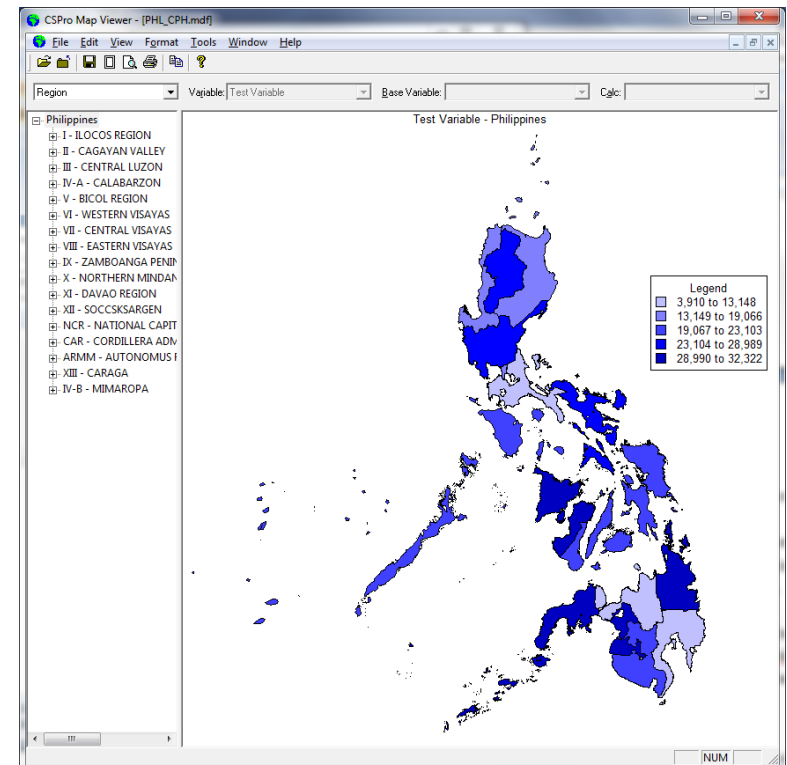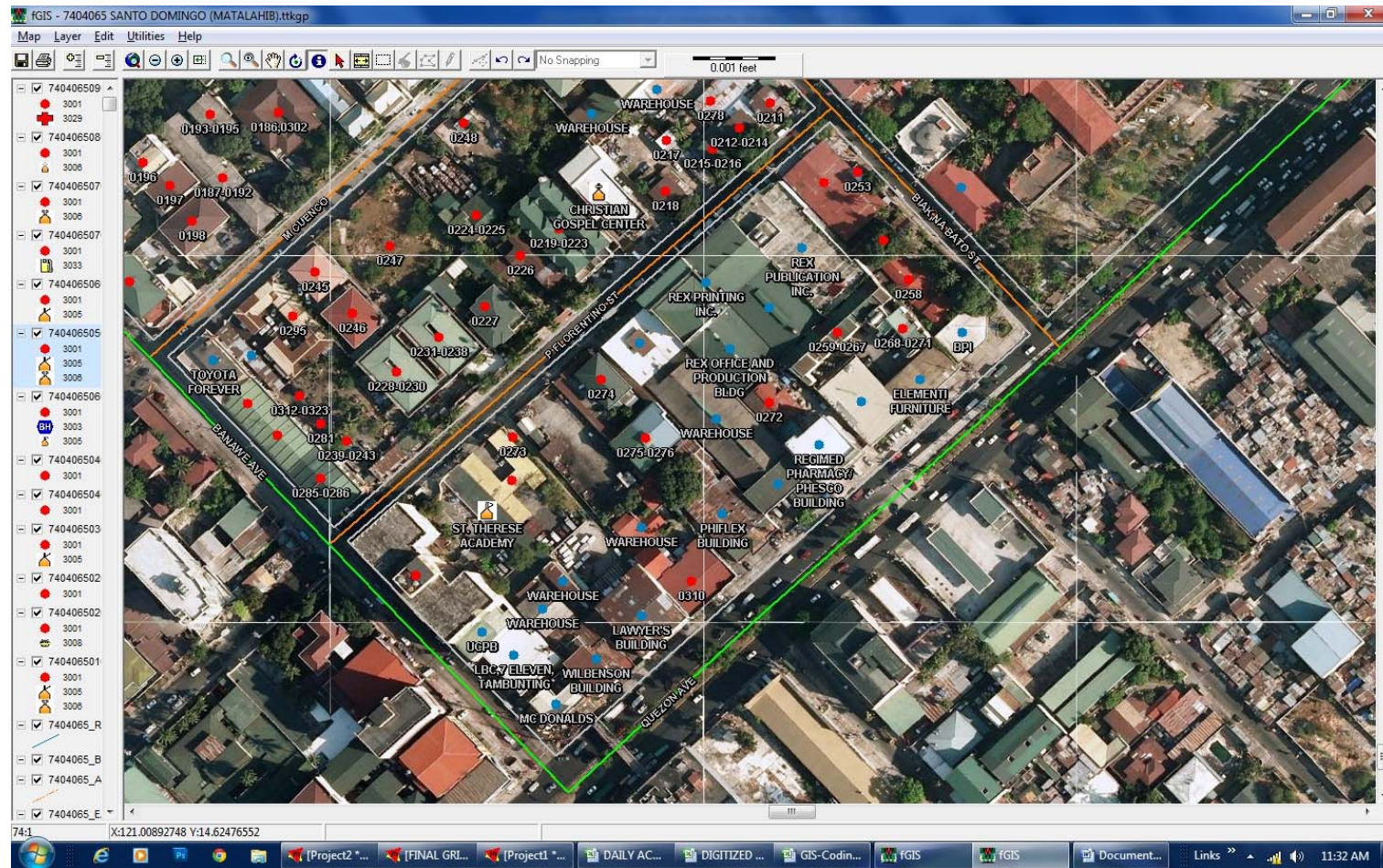
Future Directions

- The PSA intends to include geospatial-based data visualization tools in its website in the near future

- PSA proposal to create a new division called Geospatial Information Management Division under the Philippine Statistics Authority

Future Directions

- Field Office Initiative to map buildings and housing units- a workable model for field offices

Digitized

buildings

Red dots: housing
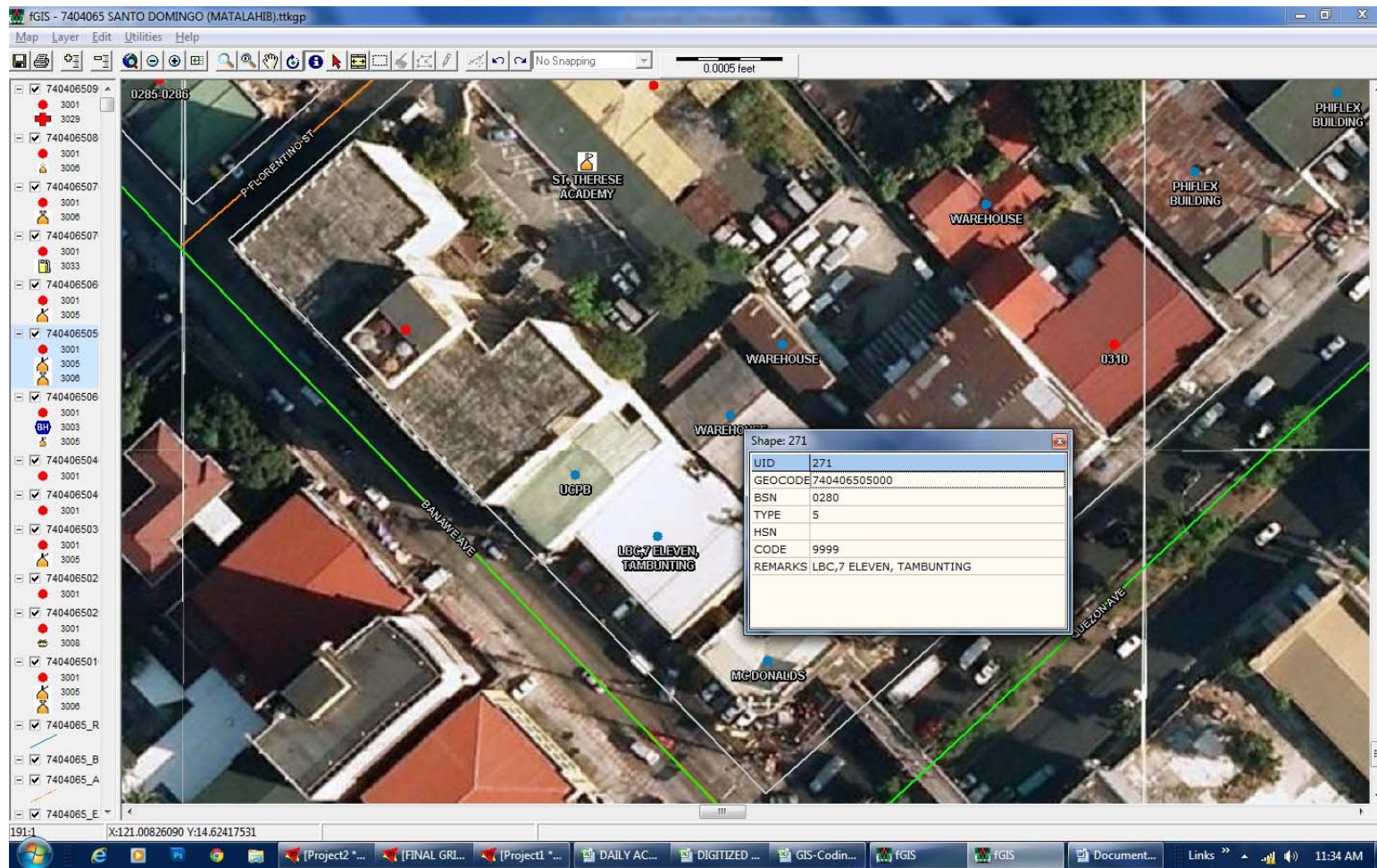
units

Blue dots:

establishments

17

Future Directions

- Field Office Initiative to map buildings and housing units- a workable model for field offices

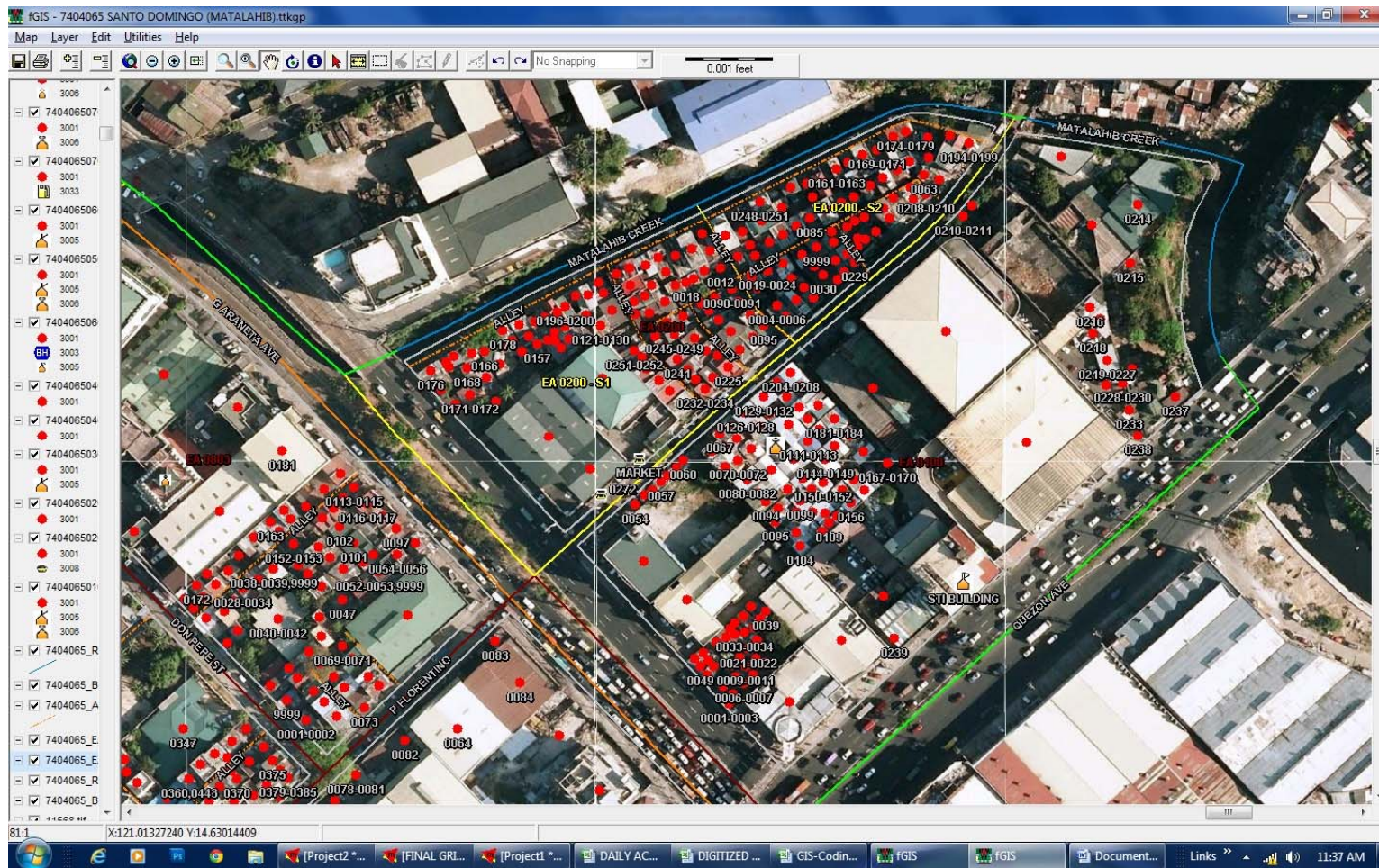Plotting

Bldg attribute

18

Future Directions

- Field Office Initiative to map buildings and housing units- a workable model for field offices
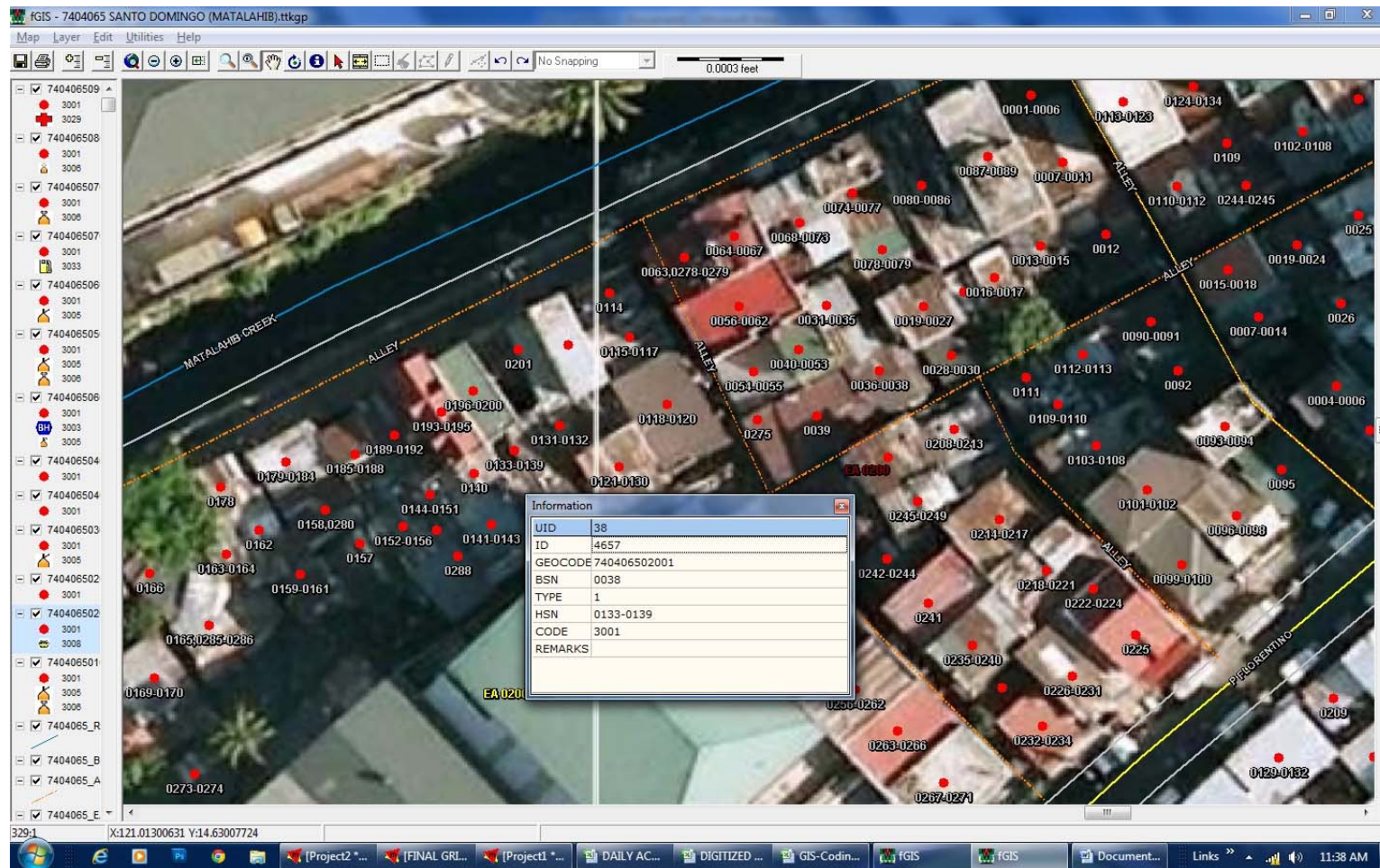
Concentration of plotted housing units

Future Directions

- Field Office Initiative to map buildings and housing units- a workable model for field offices

Plotting

Attribute of

Housing units

20

Thank you !