



Development of Disaster Resilient Campus Land Use Plan of Bicol University using Open Source Softwares

Department of Geodetic Engineering, Legazpi City
Bicol Region, Philippines



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Adviser: Prof. Ana Marie Abante, GE/CE/ENP

OUTLINE OF PRESENTATION

- Introduction
- Field Data Collection Method
- Data Processing and Validation
- Overview Of The Campus Land Use Plan
Year 2016-2026
- Realization of the Campus Land Use Plan
Year 2016

Introduction

- **Bicol University**, the premiere state university in Bicol Region

➤ aspires to be a world-class

➤ Facing an internal challenge of crafting a **campus physical development plan**.



➤ business-as-usual attitude will not do the trick.

Geographic Location



JERRY JETHRO CALAG

Data Collection

My Tracks

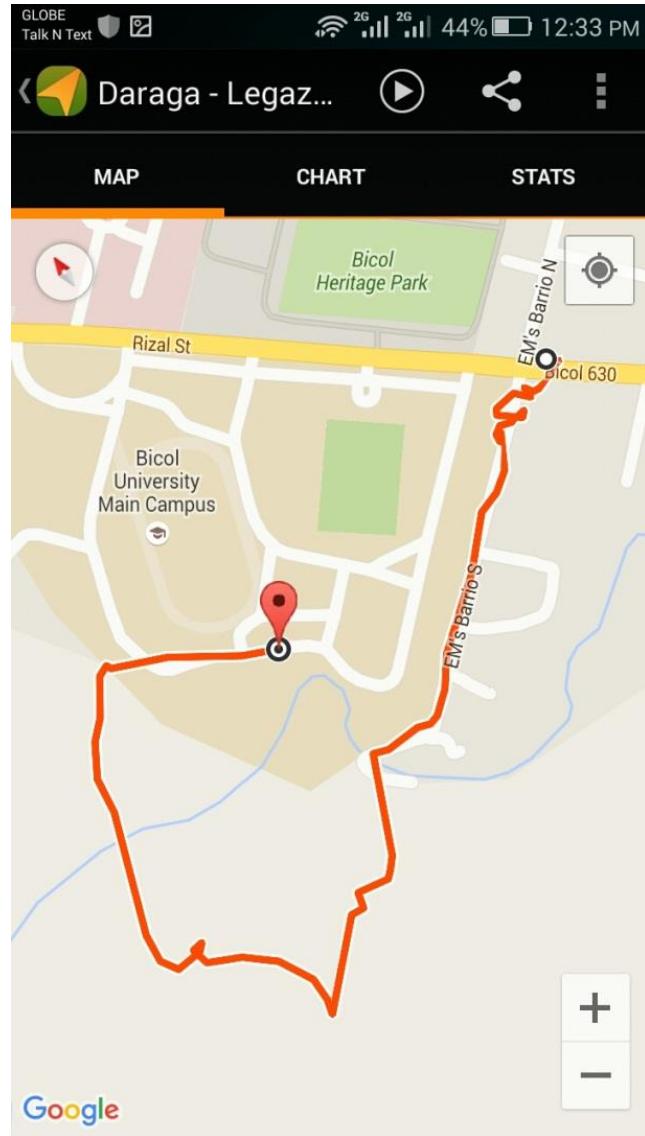
- My Tracks were used to map the following:
- the existing road network, foot path and eco-trail utilized by informal settlers
- location of buildings (school buildings, administrative building and other structures)

Data Collection

My Tracks

- location of sports facilities
- location of landmarks and cultural sites
- location of parks and open spaces
- location of sports and recreation
- location of the potential sites for the priority projects

My Tracks



Data Collection

- **GeoCam** were used to capture the picture and the location and other features of the following:
- Status of vegetation and land cover of the campus
- Forest vegetative cover of the experimental forest
- Condition of buildings and school facilities
- Development constraints

Data Collection

- Condition of roads
- Location of house built by the informal settlers inside the campus
- Location of gabaldon school houses
- Location of trees
- Location of gates and other access points
- Sagumayon River Ecosystem, a potential eco-tourism site

FUNCTIONALITIES OF GEOCAM

- MAIN MENU

1. Cam: access all camera settings

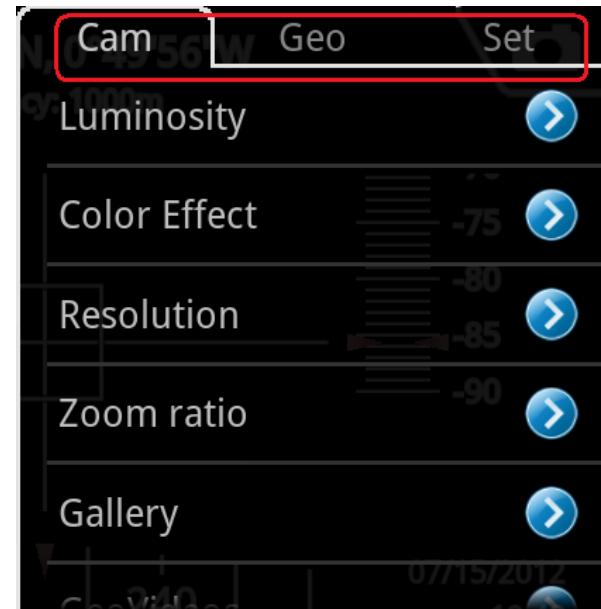
2. Geo: geographical:

- Geo markers: add, remove, view your geo markers

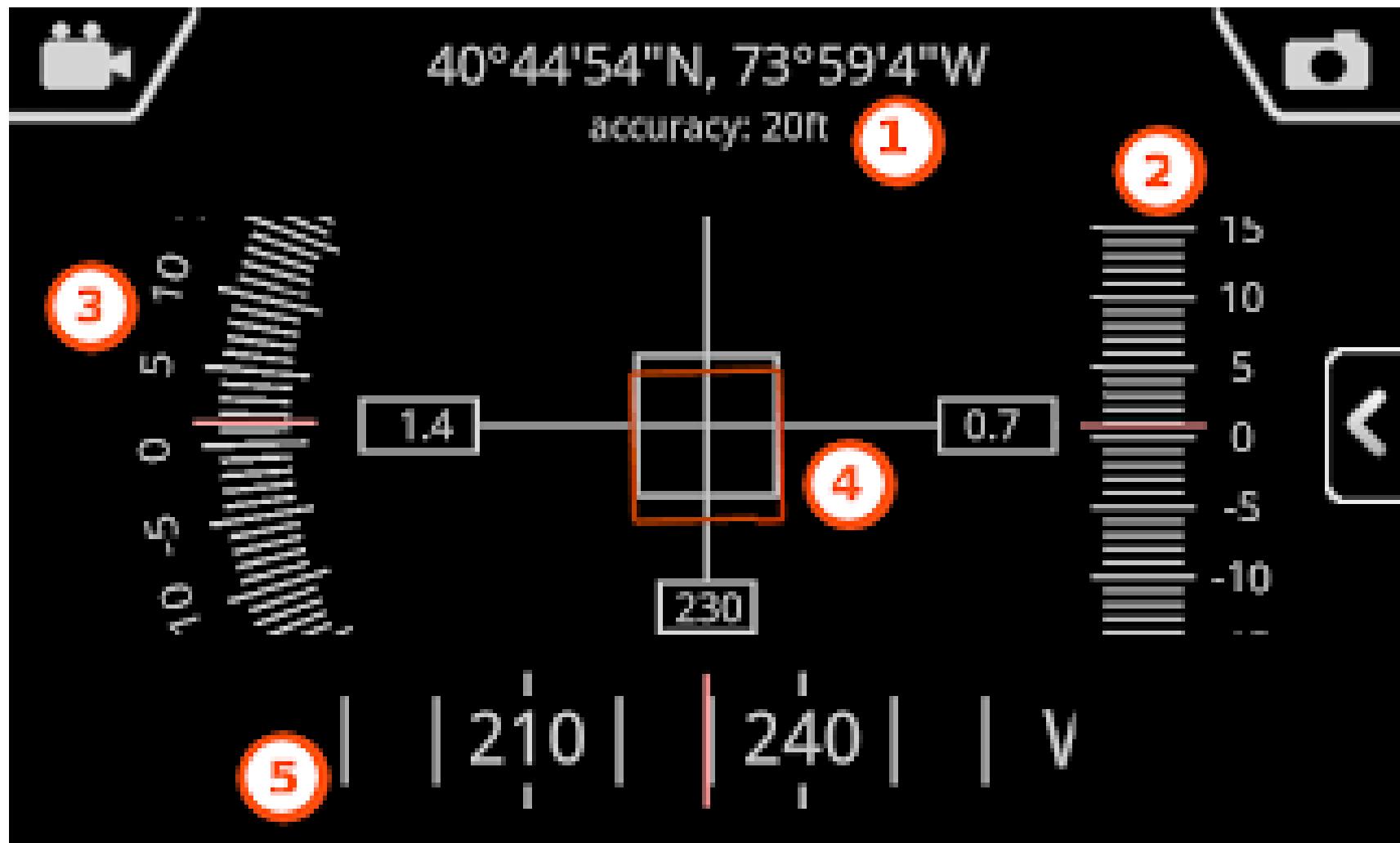
- Captures: See your pictures on a map, and export them to Google Earth

- Triangulation: Measure stuff

3. Set: various settings covered all across these help pages.

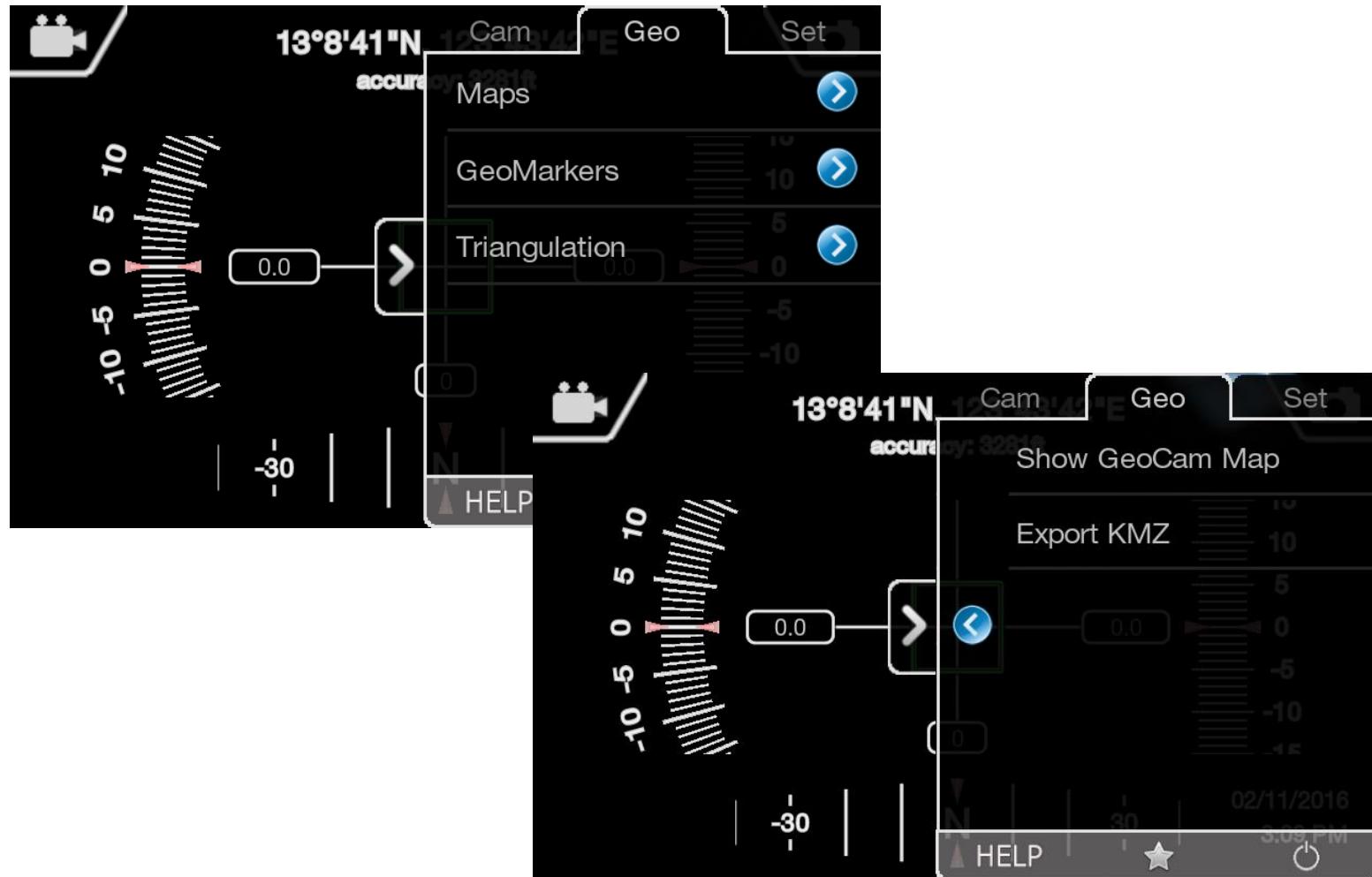


Main screen cursors



1. Your GPS location and its accuracy.
2. Your device's inclination in degrees relative to an horizontal axis parallel to your view. This is often referred to as "pitch".
3. Your device's inclination in degrees relative to an horizontal axis perpendicular to your view. This is often referred to as "roll".
4. A dynamic cursor that helps you stay level. When it is green, you are good. The more you move away from the center point, the more it will become red. It also shows you pitch, roll and heading in degree values. You can choose to display or not this cursor, with or without the numerical values
5. Compass: your orientation in degrees relative to earth's magnetic or geographic north.
6. Altimeter: only available when a GPS fix is available
7. Date and Time

GEOCAM





0.00K/s



3:10



80%



Category

Storage

Storage

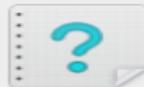
SD card

Documents



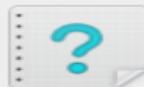
geodetic_code_of_ethics.pdf

11/09/2015 191.39KB



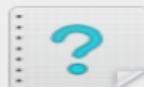
GeoCam_KMZ28388.kmz

02/11/2016 60.15MB



GeoLogger.gpx

02/11/2016 2.09KB



GeoLogger.kml

02/11/2016 1.73KB



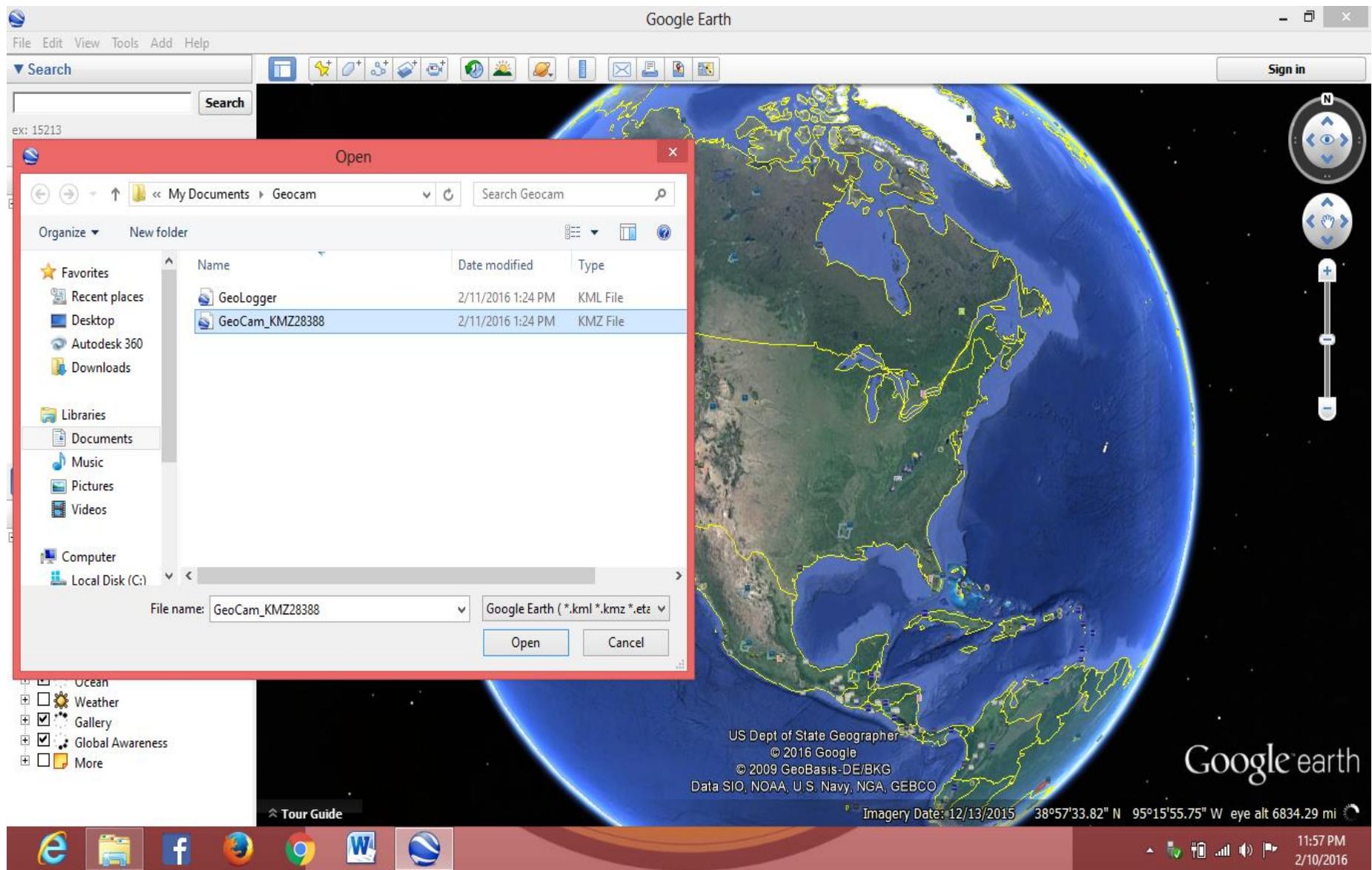
notice of awardp.pdf

02/04/2016 254.71KB

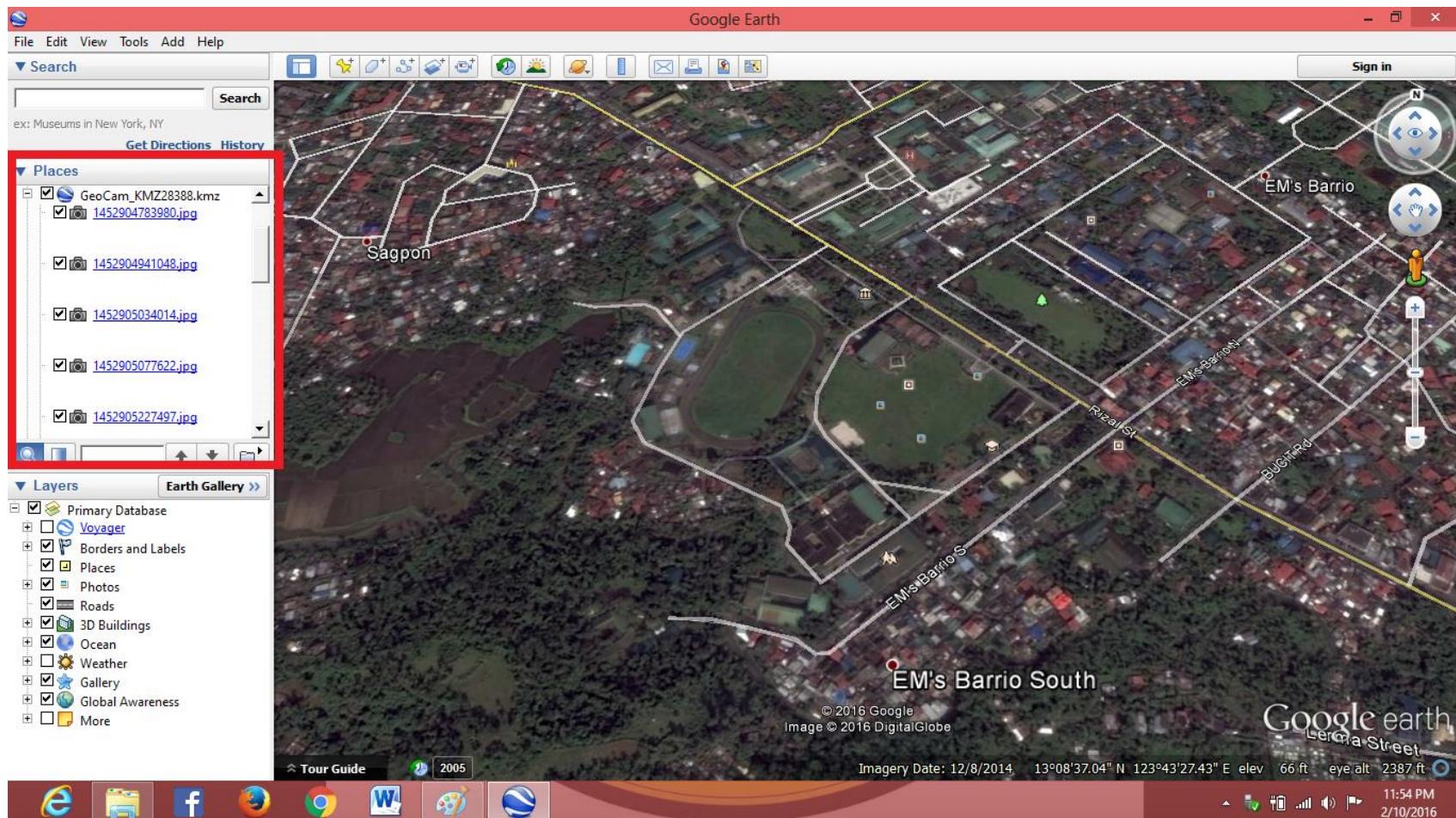
New folder

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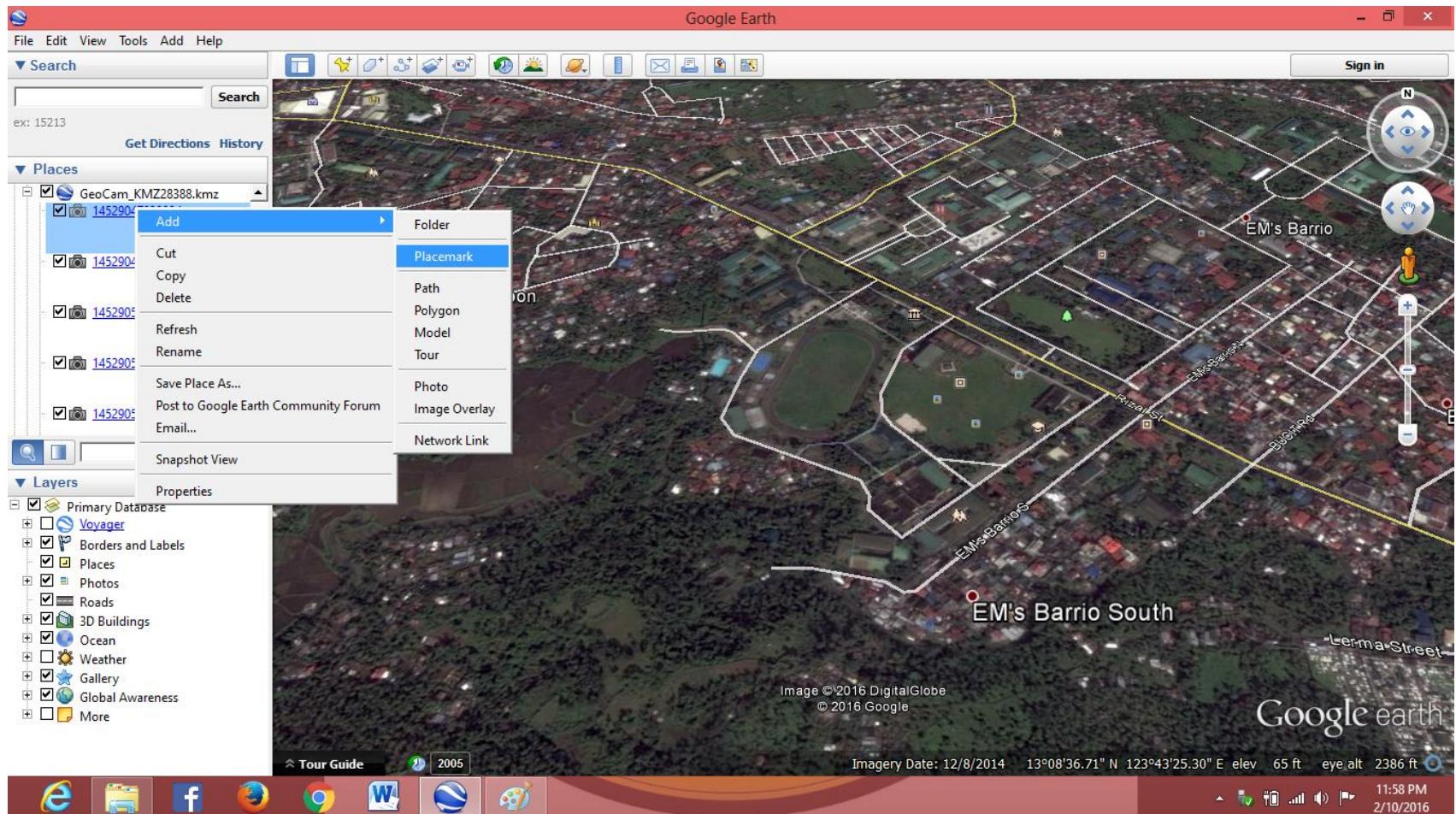
Data Processing



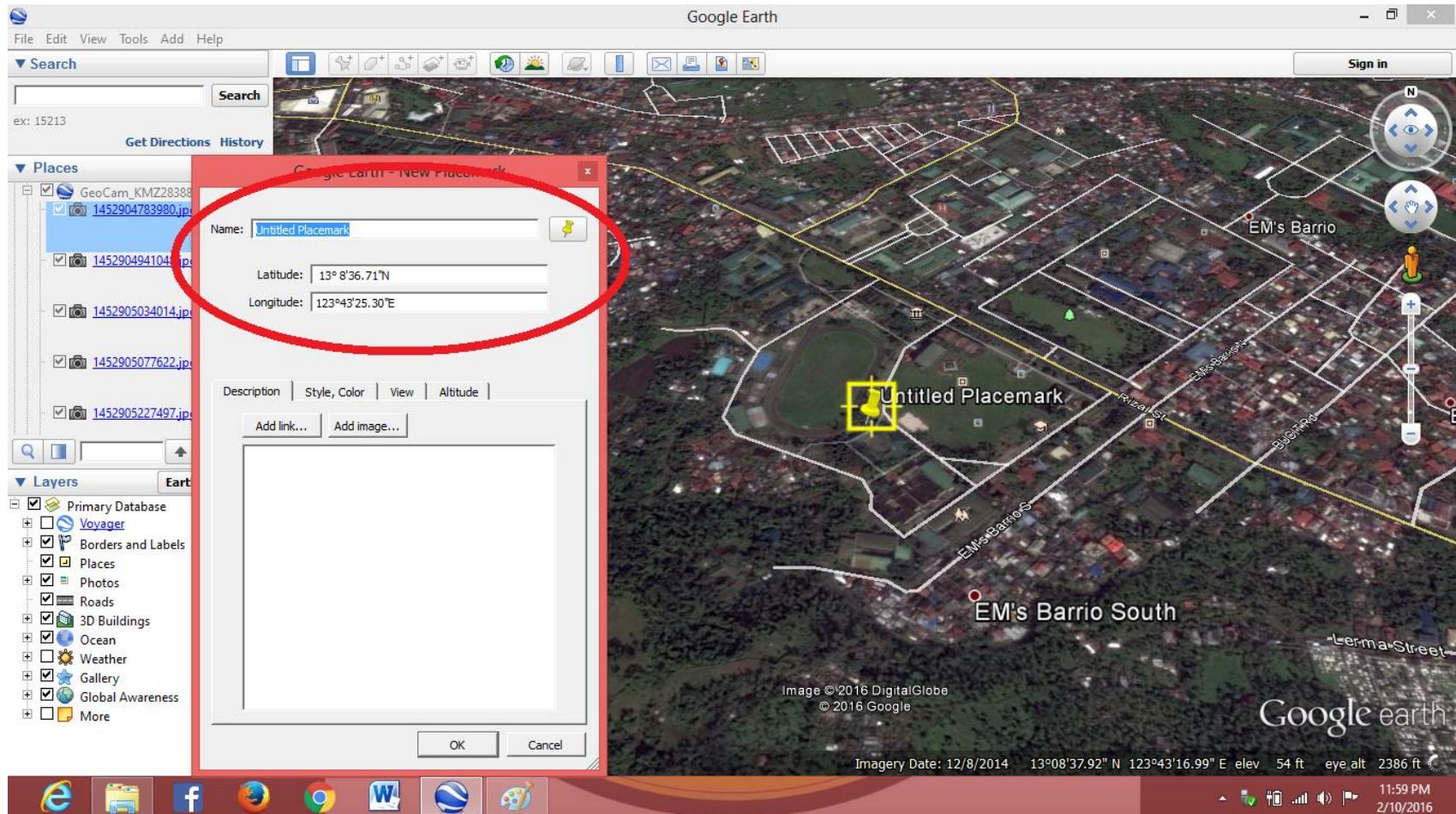
Open GeoCam KMZ File



Insert Placemark



Insert coordinates



File Edit View Tools Add Help

▼ Search

Search

ex: 15213

Sign in

Get Directions History

▼ Places

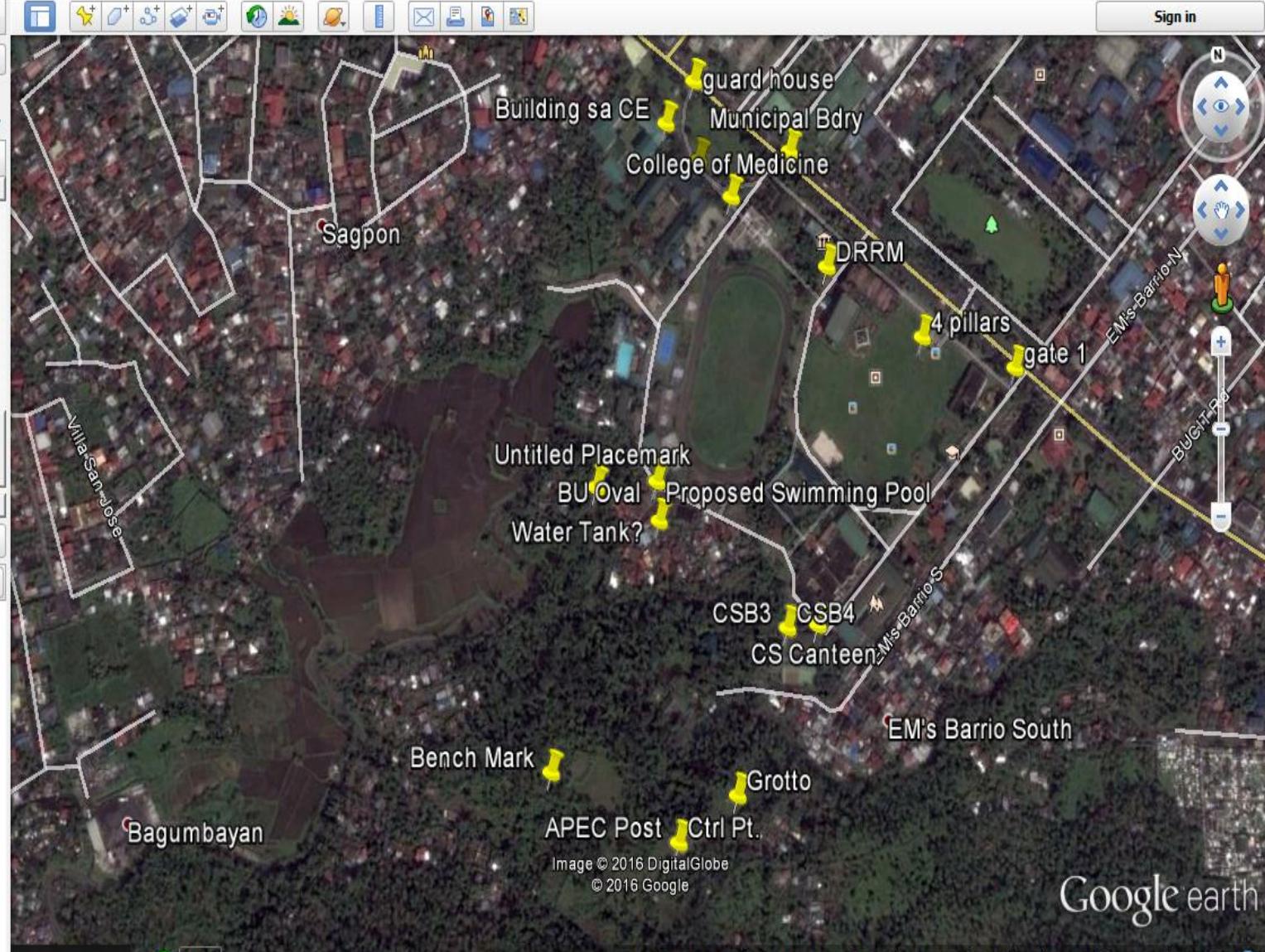
- Ctrl Pt.
- APEC Post
- Bench Mark
- Untitled Placemark
- Proposed Swimming Pool
- Proposed Office blah bla...
- BU Oval
- Water Tank?
- CSB4
- CSB3
- CS Canteen

- GeoCam_KMZ28388.kmz
- Temporary Places

▼ Layers

Earth Gallery >>

- Primary Database
- Voyager
- Borders and Labels
- Places
- Photos
- Roads
- 3D Buildings
- Ocean
- Weather
- Gallery
- Global Awareness
- More



Google earth

Tour Guide

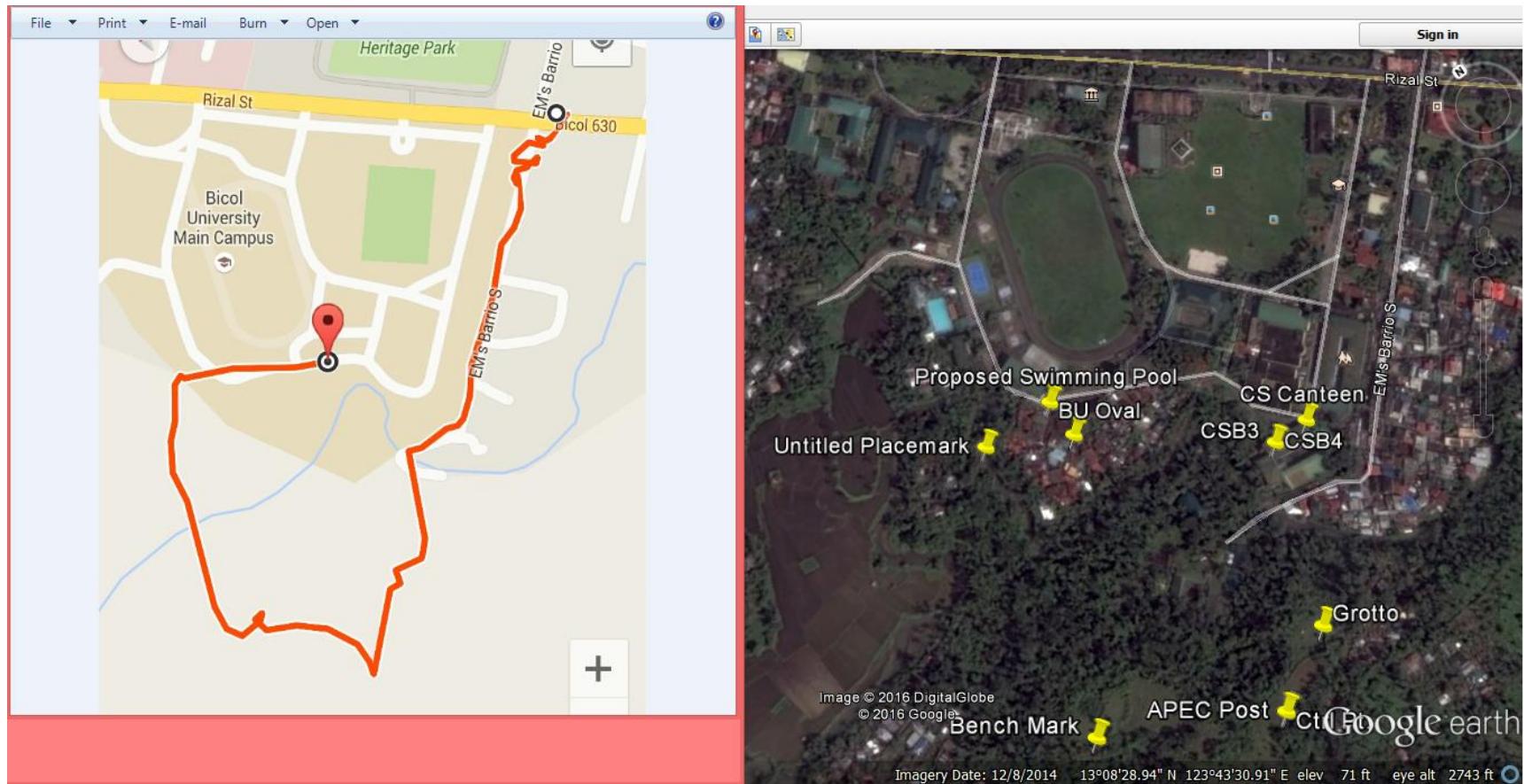
2005

Imagery Date: 12/8/2014 13°08'34.53" N 123°43'35.44" E elev 59 ft eye alt 3617 ft

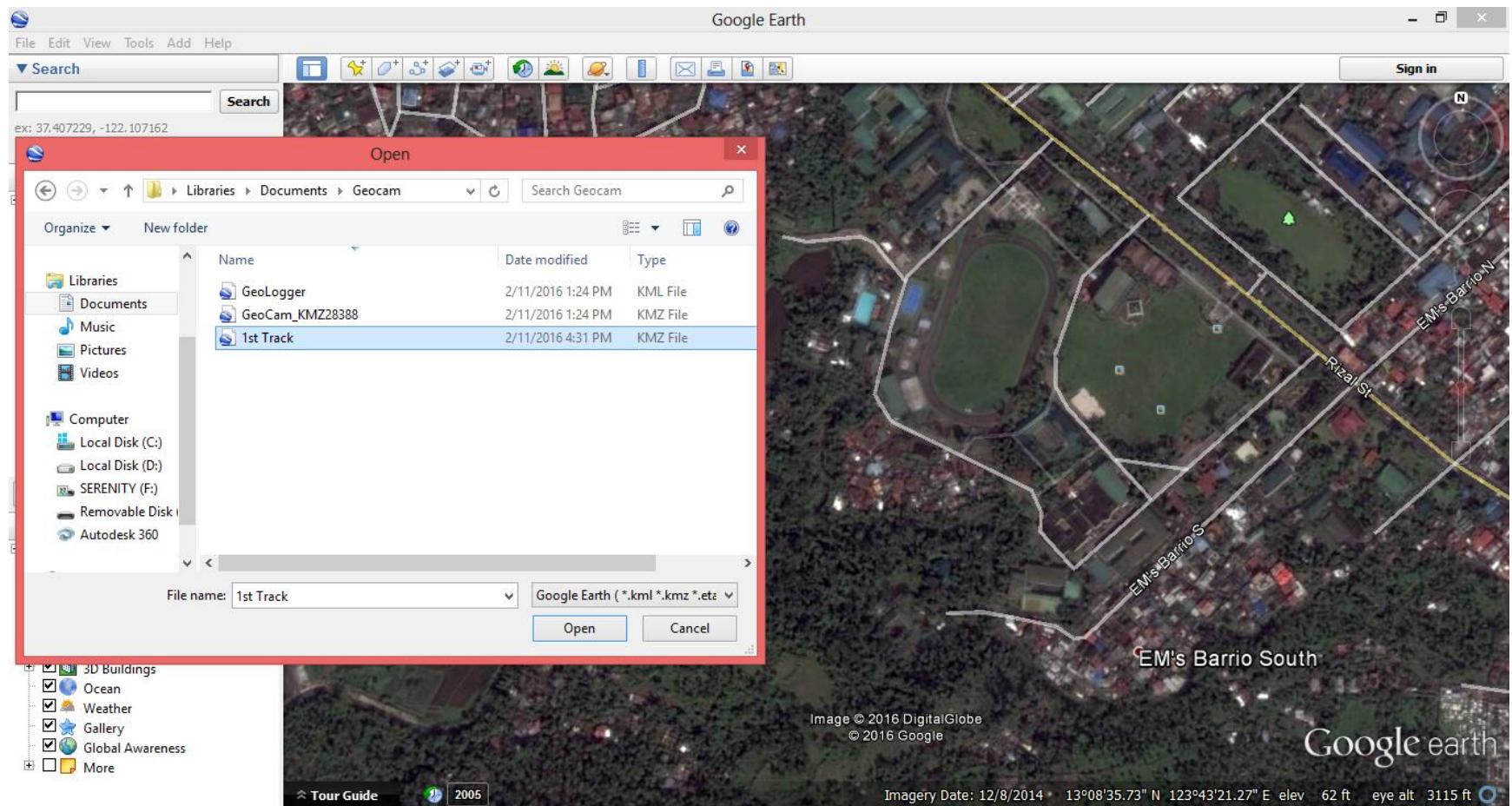
12:03 AM
2/11/2016



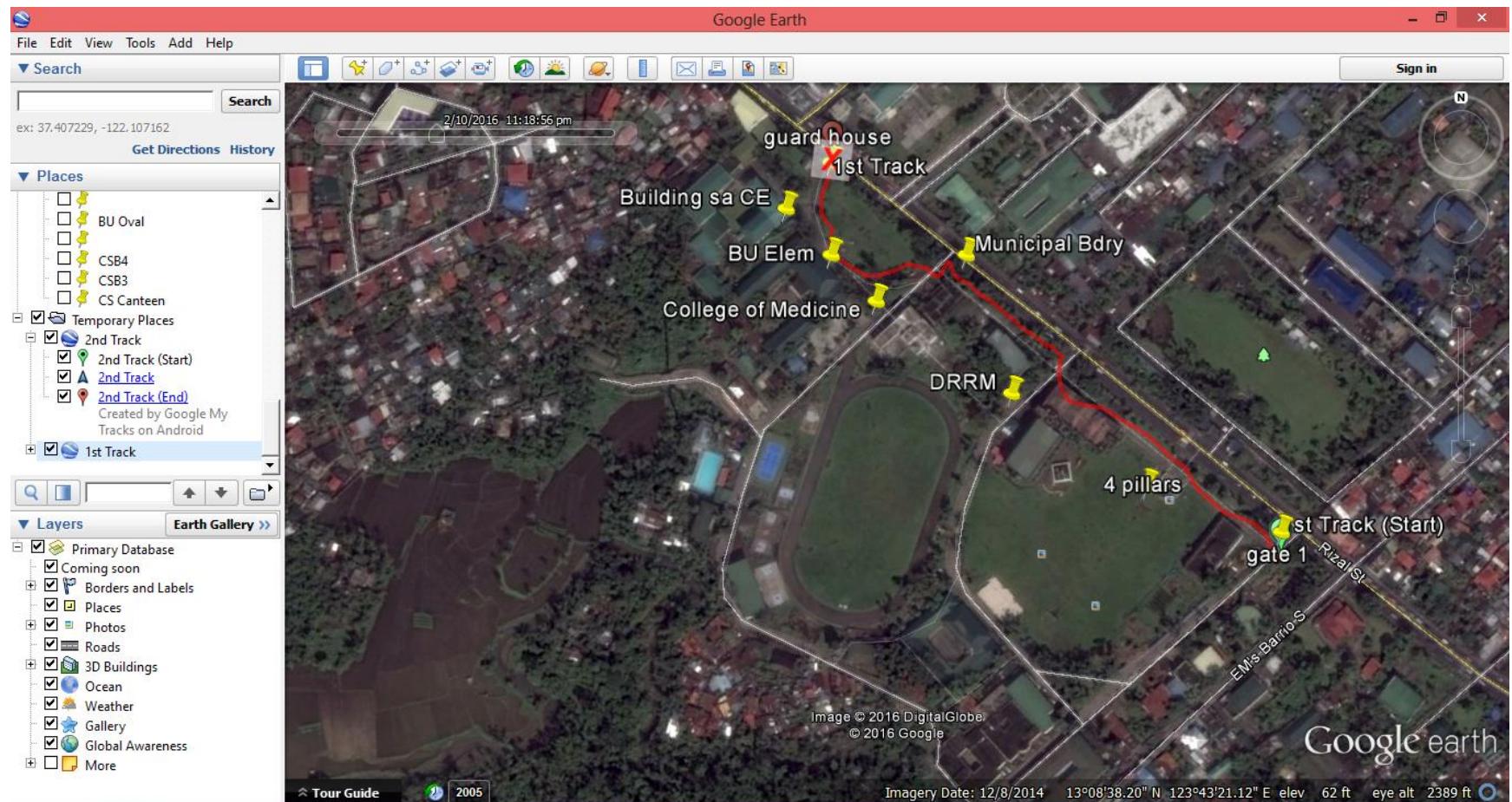
My Tracks & Google Earth



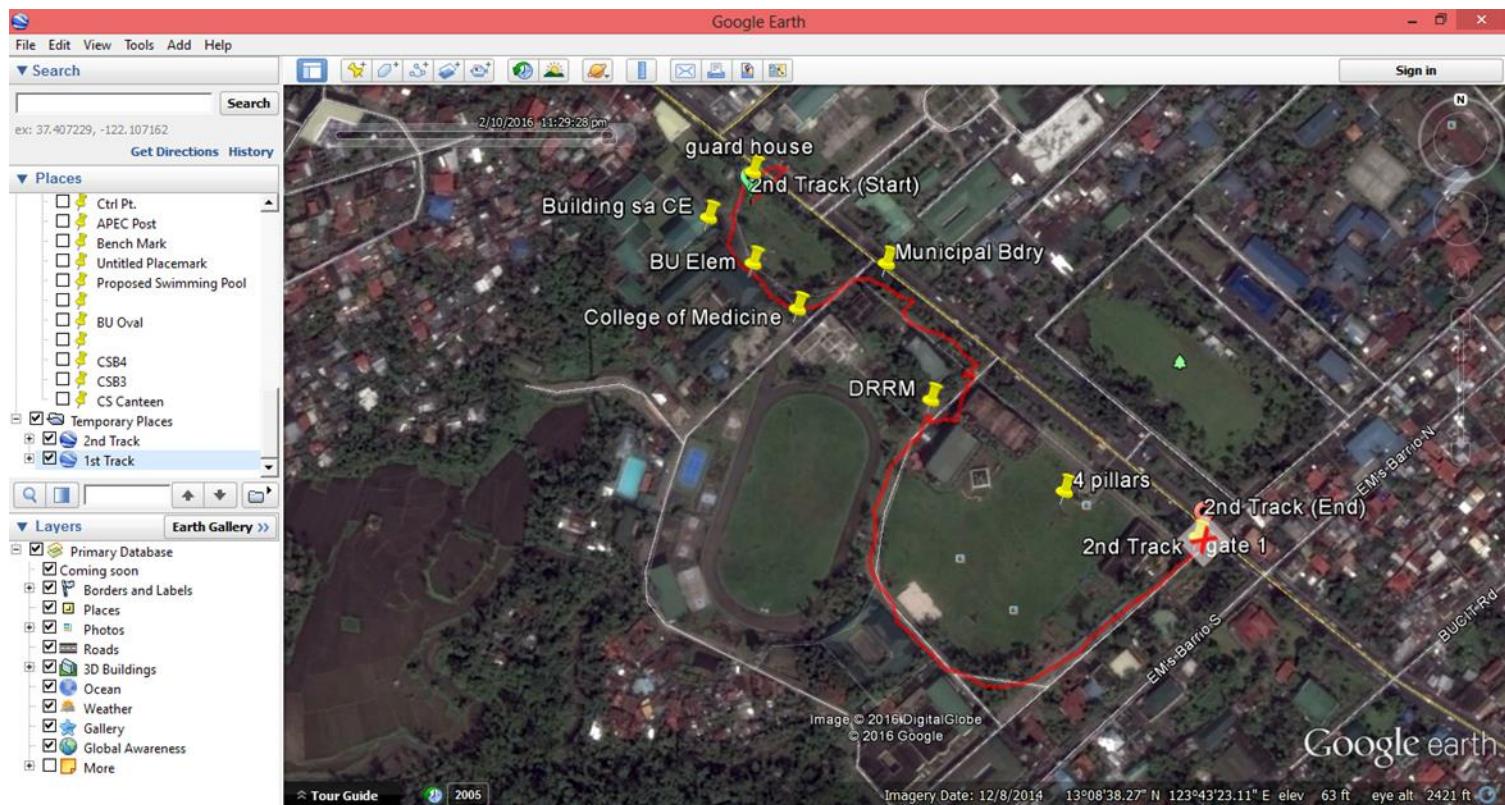
Open My Tracks KMZ file



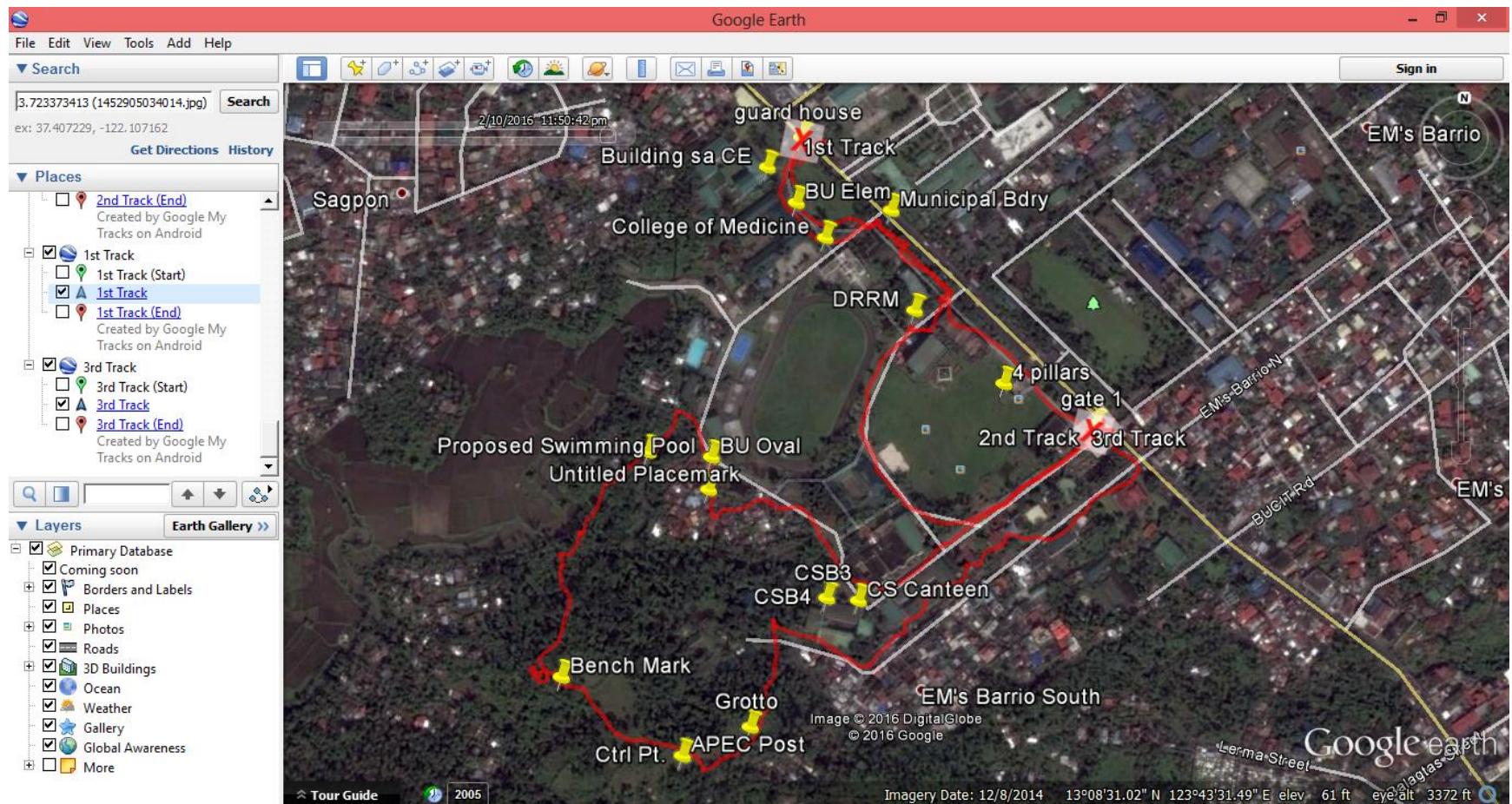
1st track

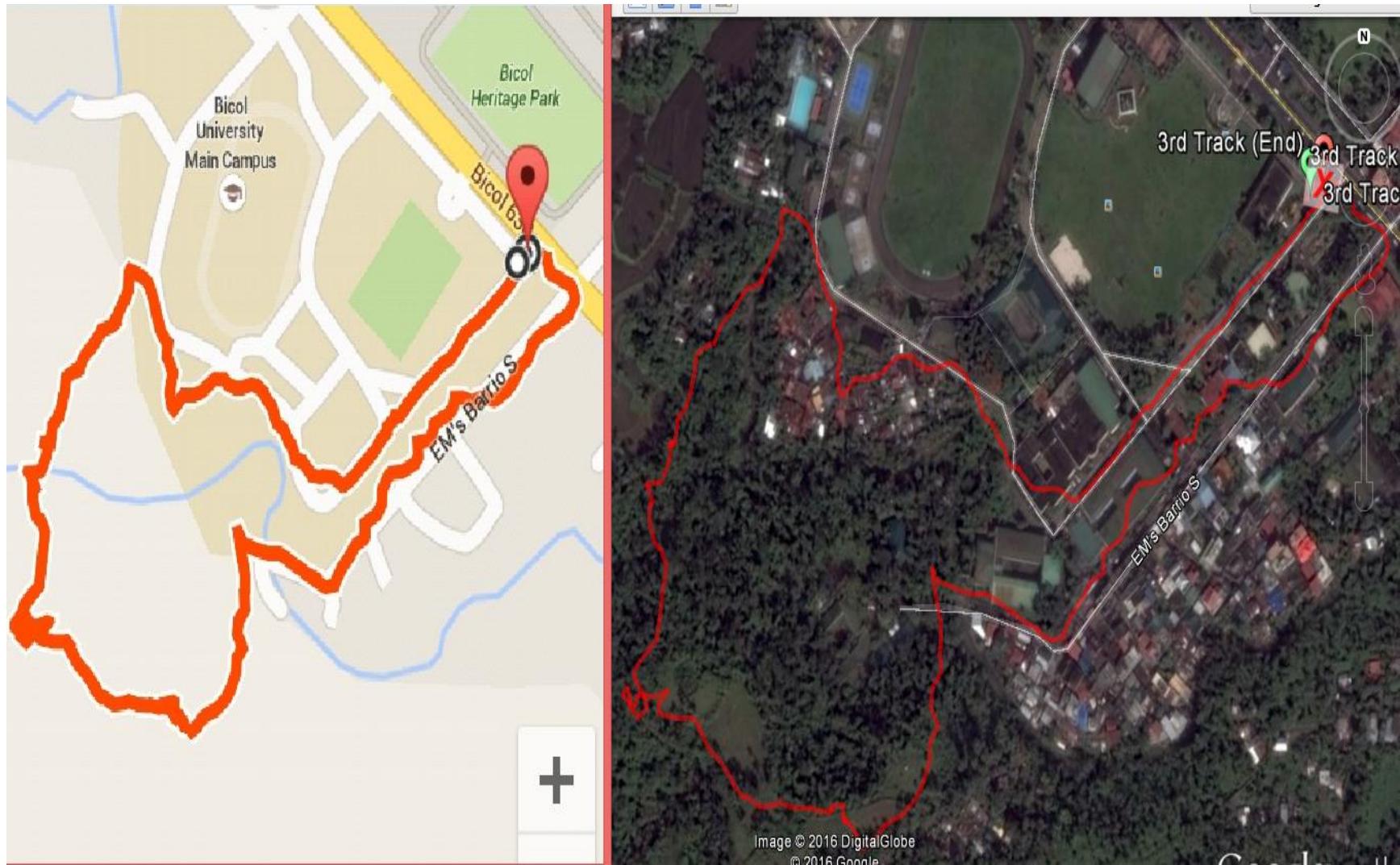


2nd track

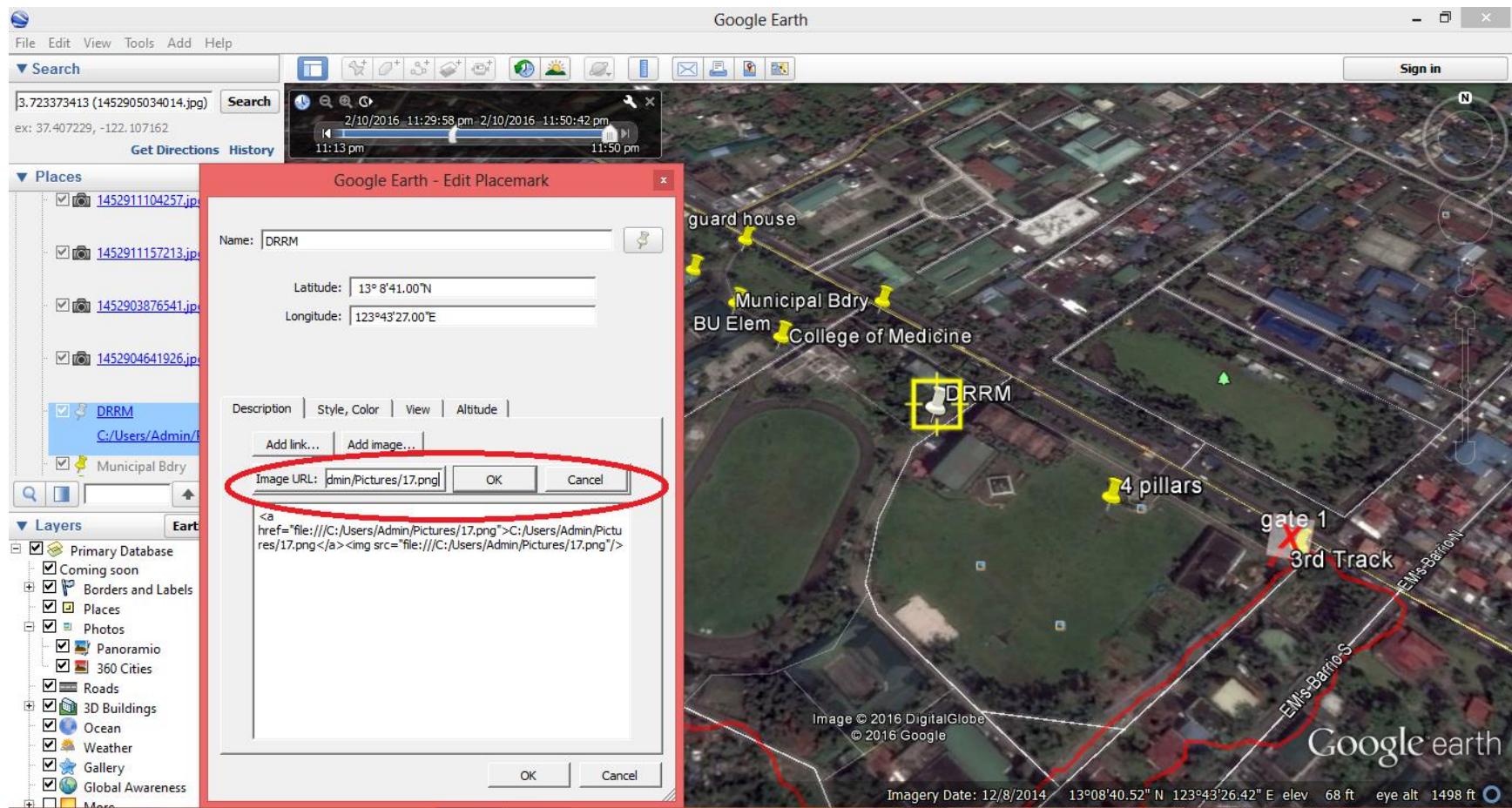


My Tracks in Google Earth

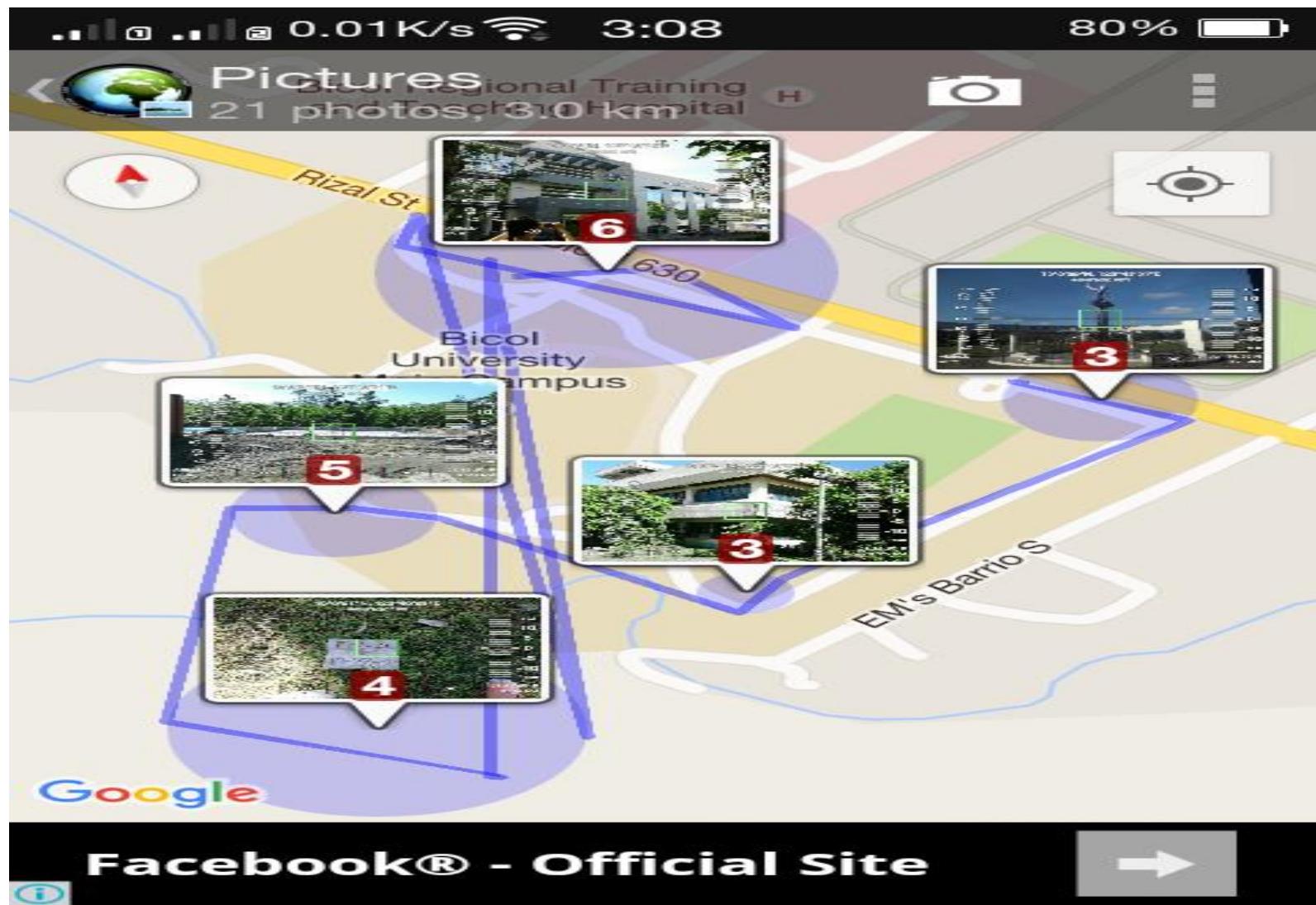


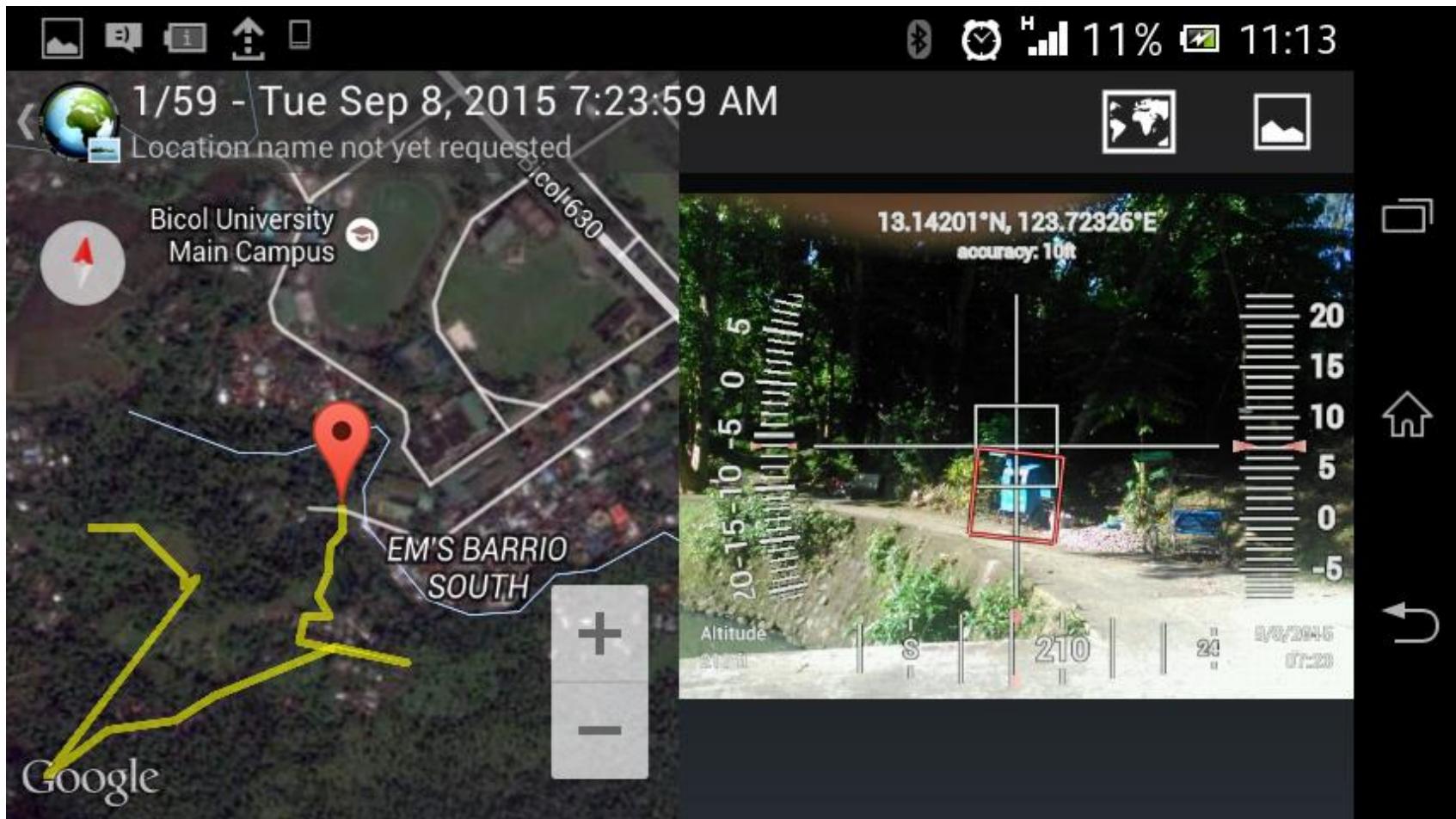


Insert Image



PHOTOMAP





GIS Software

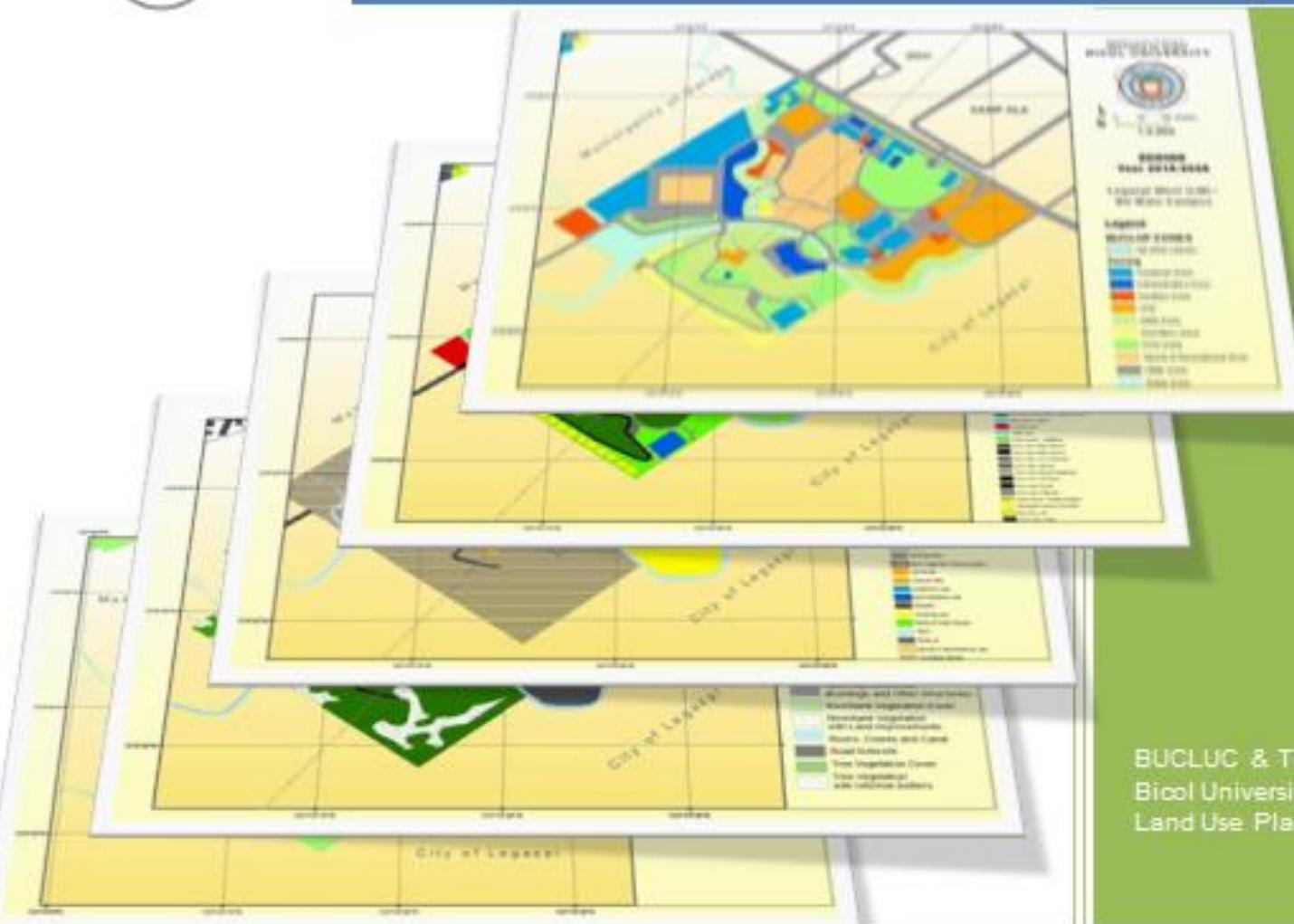
- Assign identification for each point location.
- Encode field observations and remarks.
- Geoprocessing and mosaicking of google earth images
- Preparation of data collection reports
- Submission of collected spatial database to the land use planner/Professor in GIS



GE 425c - GIS Laboratory
BUCENG

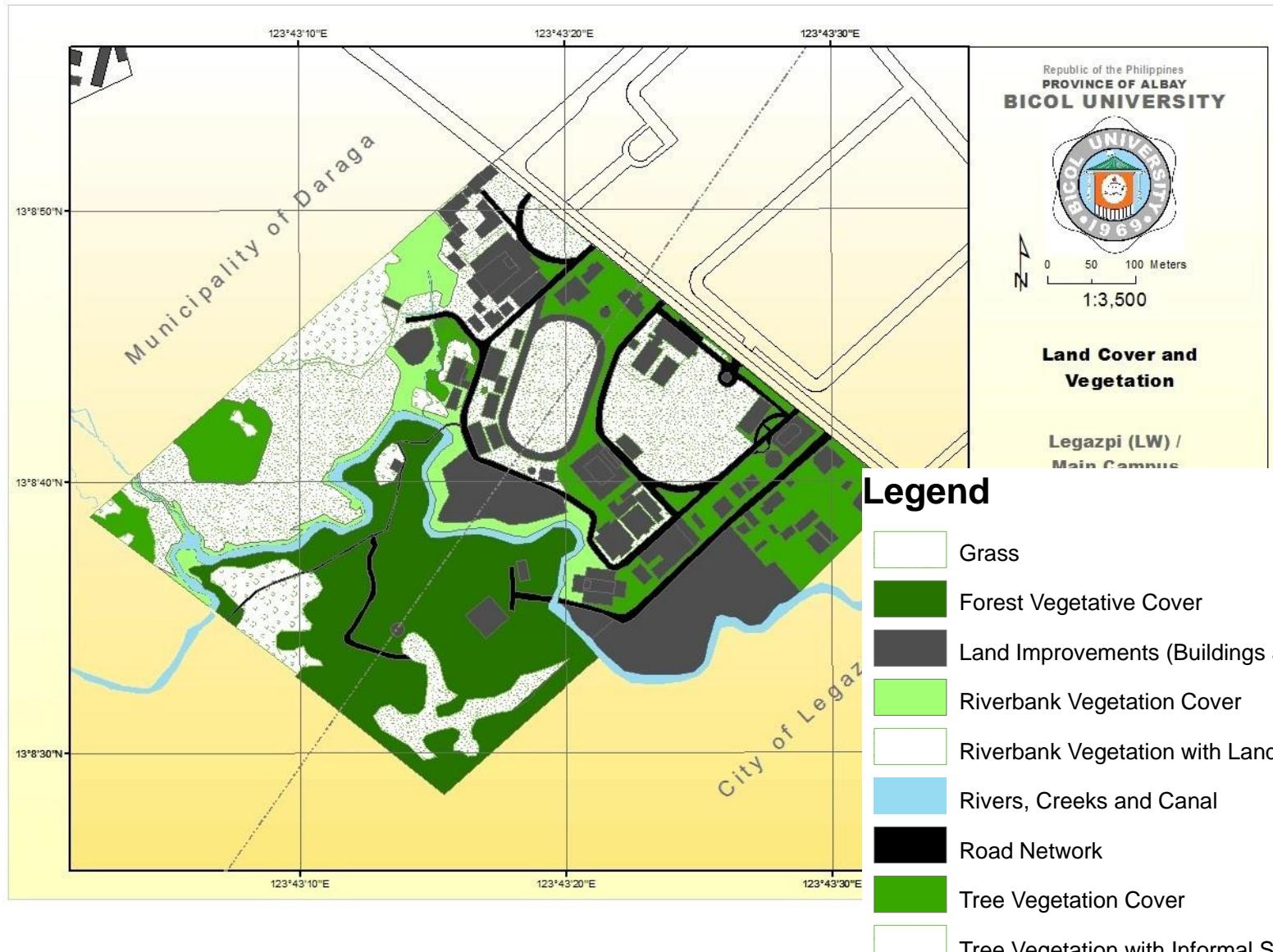


The BU Campus Land Use Plan, Legazpi West (LW) / BU Main Campus



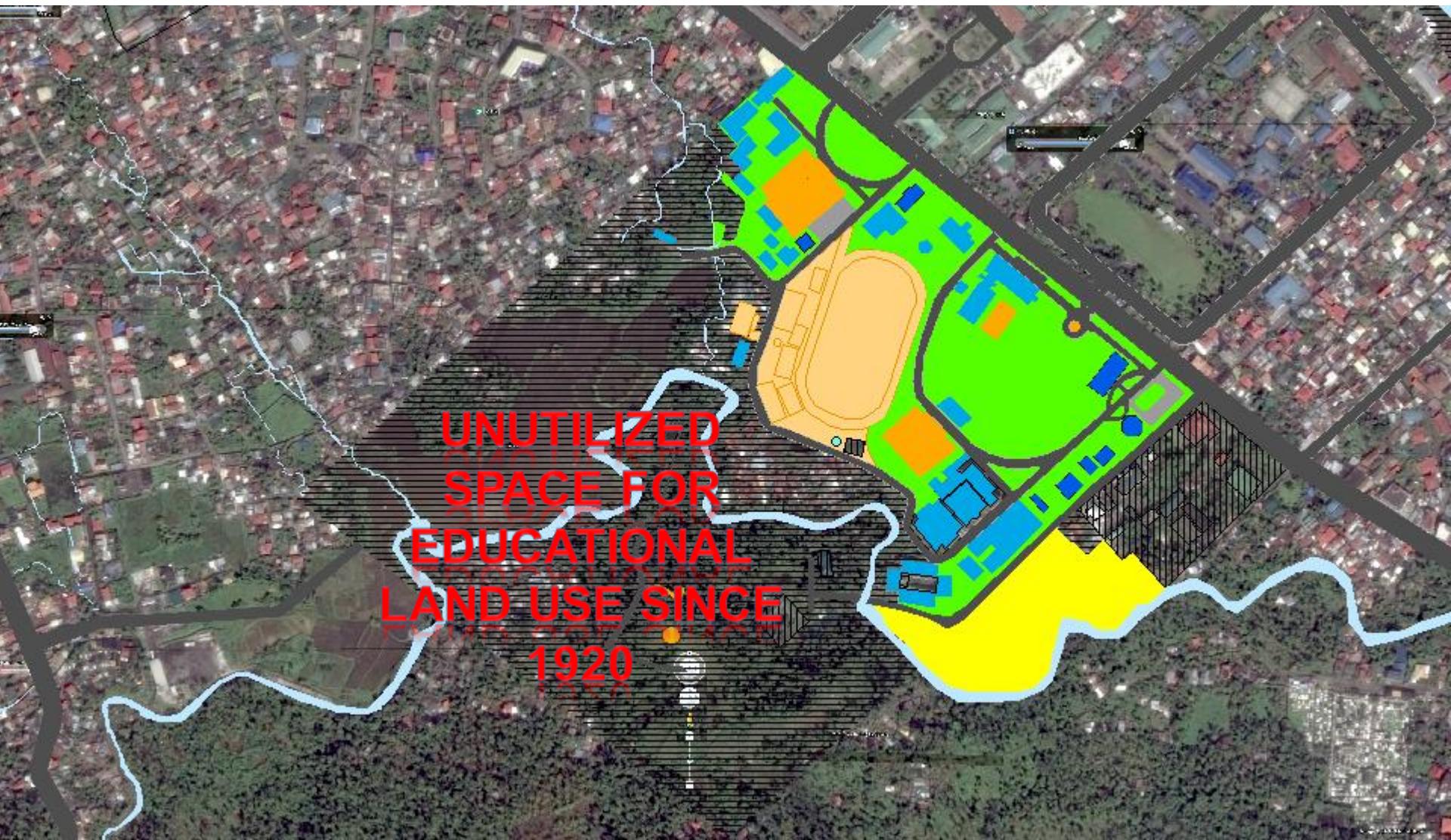
BUCLUC & TWG
Bicol University
Land Use Planning Year 2015-2026

Vegetation and Land Cover, Year 2015



Land Utilization/Land Use, Year 2015

Legend



Existing Facilities



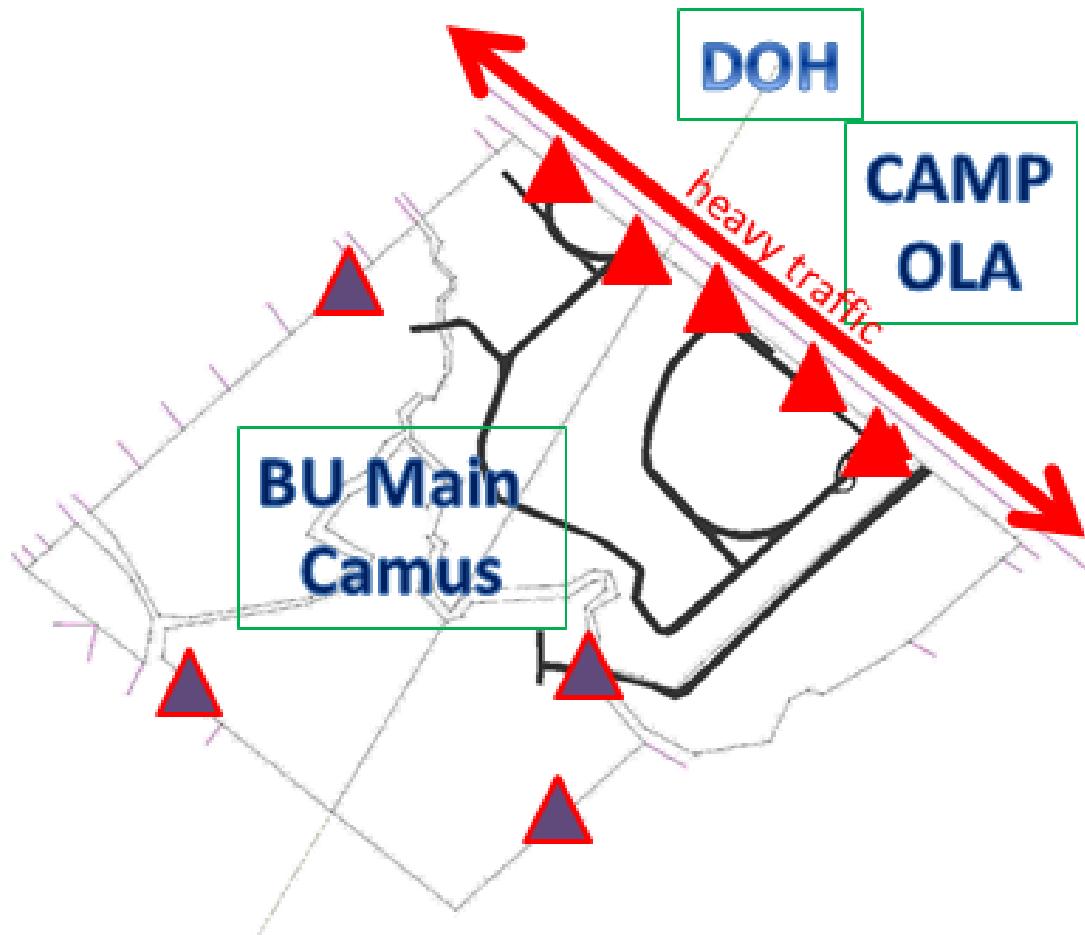
Existing Facilities



Existing Facilities



Accesibility

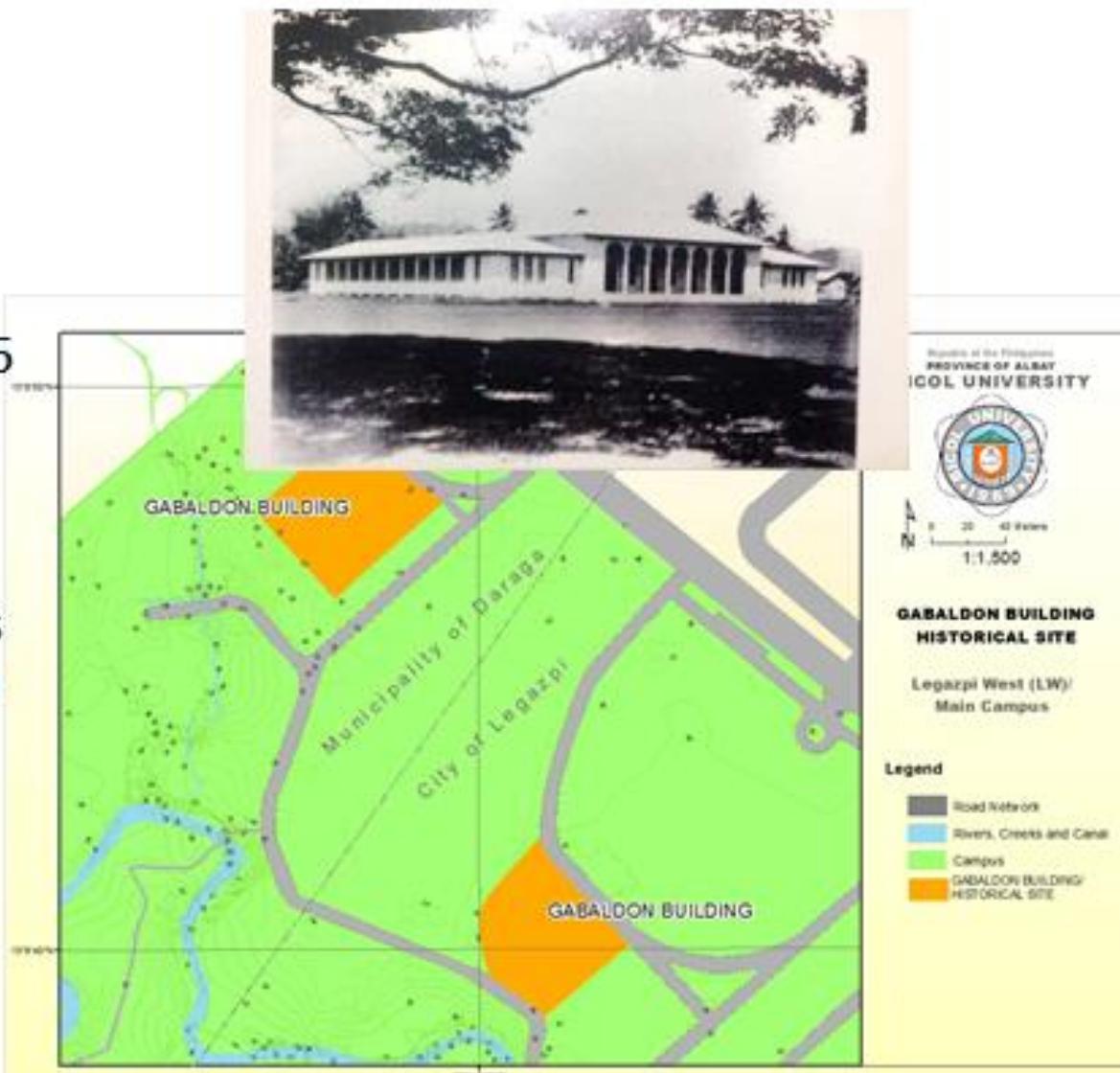


- 5 gates serve as entry/exit points linking the interior road network
- heavy traffic during school and office hours on 7:00 AM and 5:00 PM
- unrestrained use old and dormant gate or unrestrained use of the spillway or Open Access due to damaged fence

Conservation Areas and Special Interests Areas

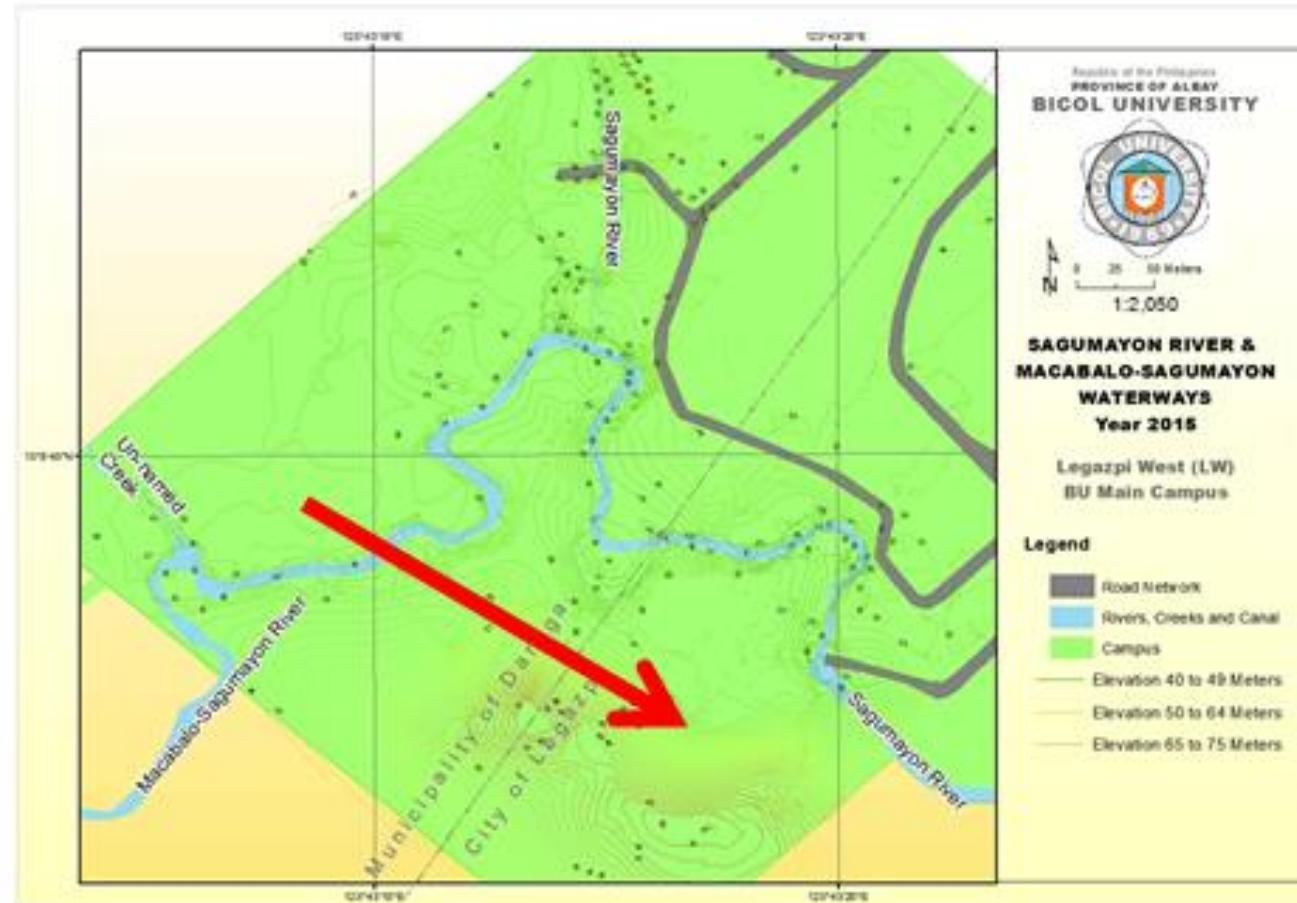
- **Gabaldon School Houses**

is a collective term for heritage schoolhouses built in the Philippines between 1907 and 1946 that follow standard plans designed by Architect William E. Parsons. The two Gabaldon Schoolhouses located within the main campus has a cultural significance and likely covered by Cultural Heritage Act of 2009 or RA 10066.

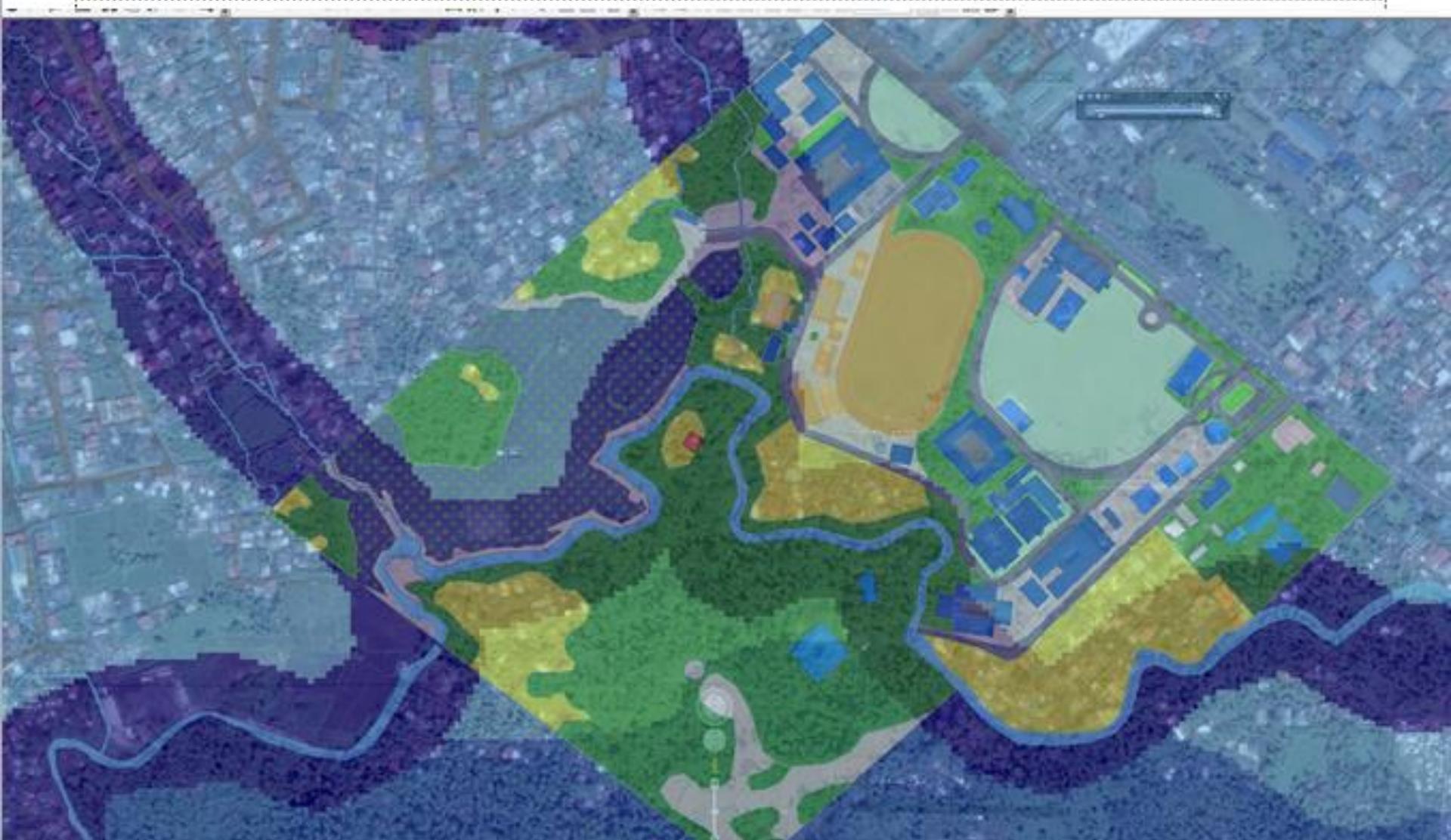


Sagumayon and Macabalo-Sagumayon Ecosystem

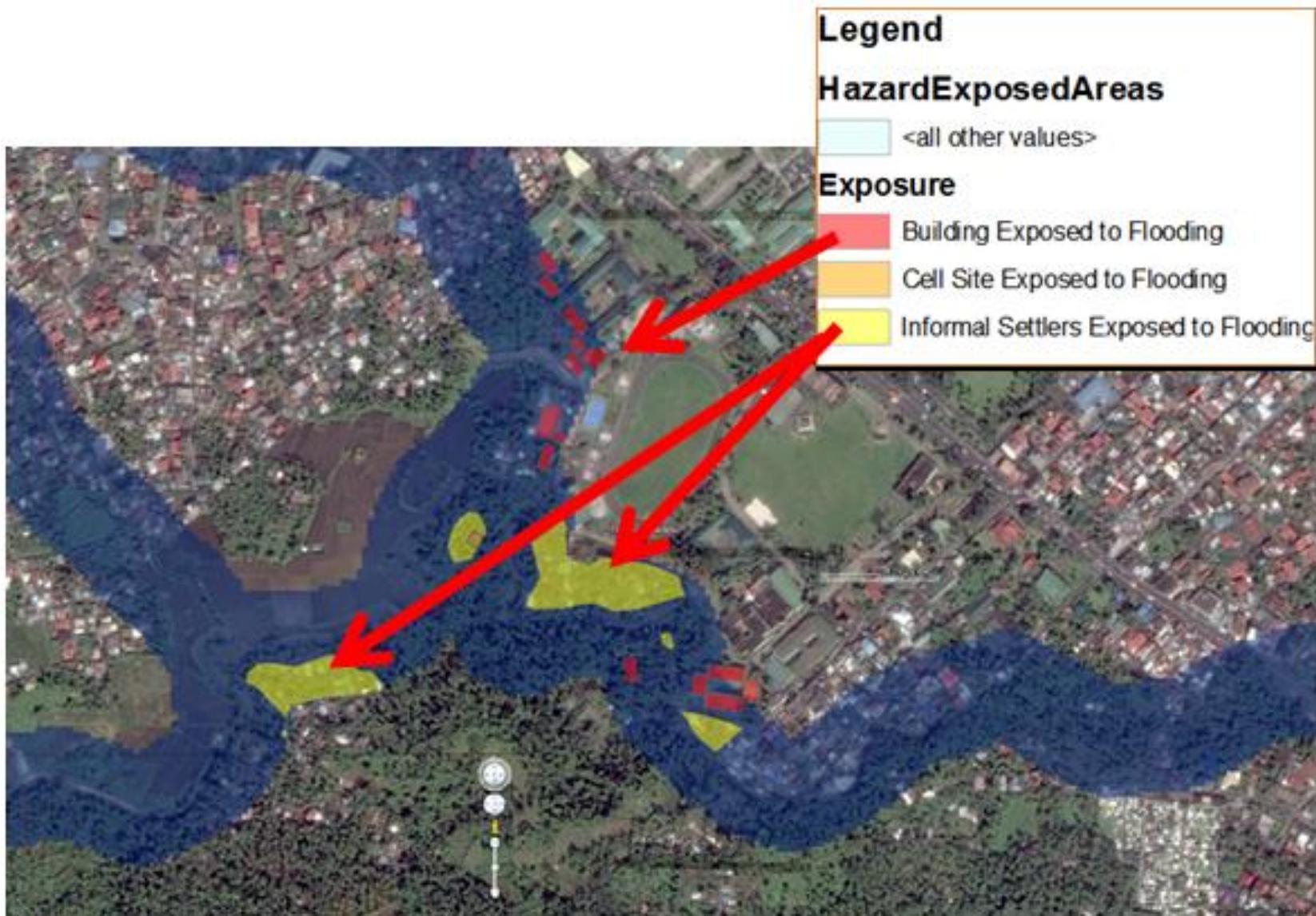
- The Sagumayon Ecosystem is an environmentally sensitive area within the main campus and potential eco-tourism site in Albay.



Flood Risk Evaluation



Development Constraints



Development Constraints

- **Earthquake Risks**
 - campus poor road network circulation and lack of pedestrian walks, ROW and alleys posses danger to students, faculty, non teaching personnel, officials including illegal inhabitants of the campus and neighboring communities.

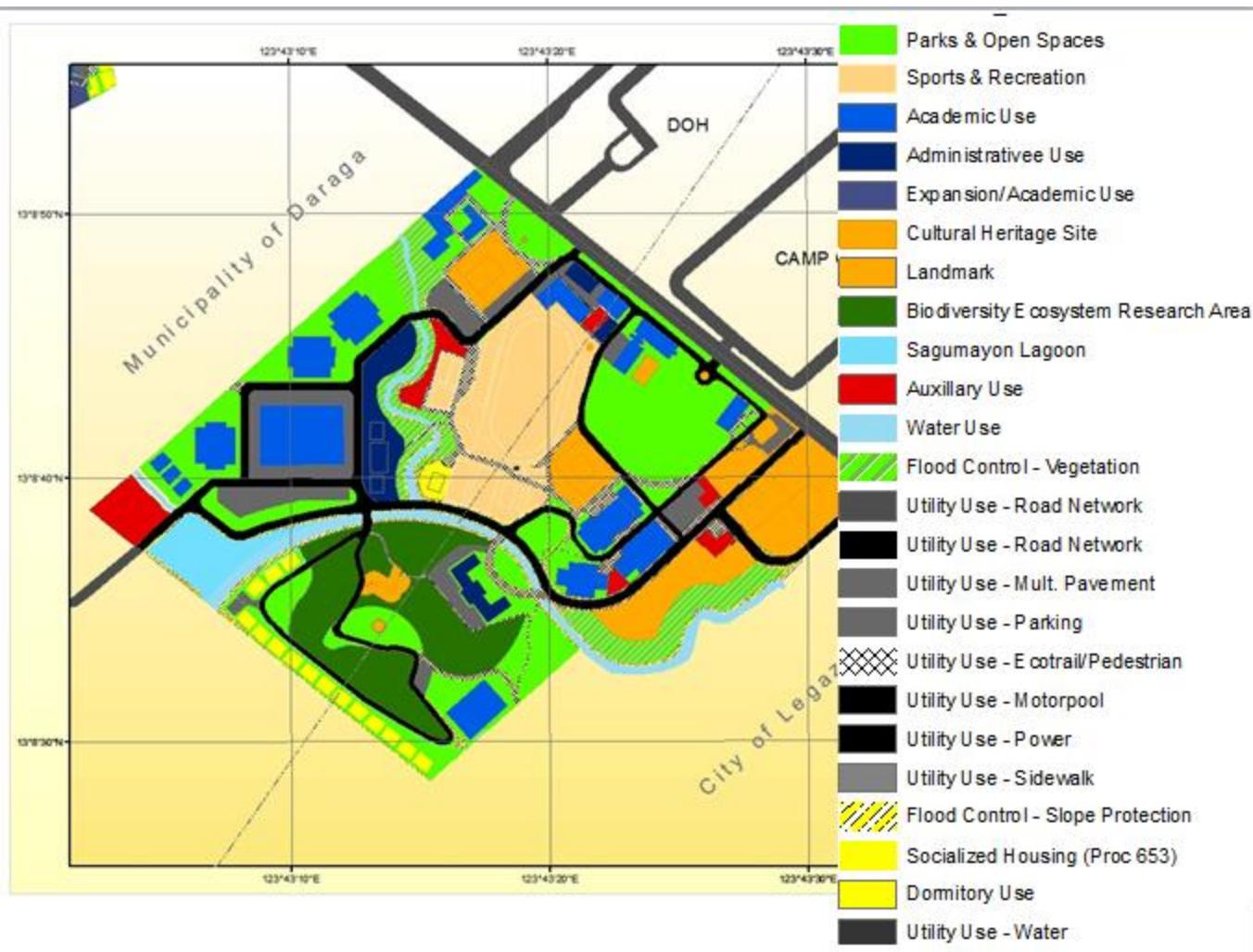


The BU CLUP, Year 2016-2026



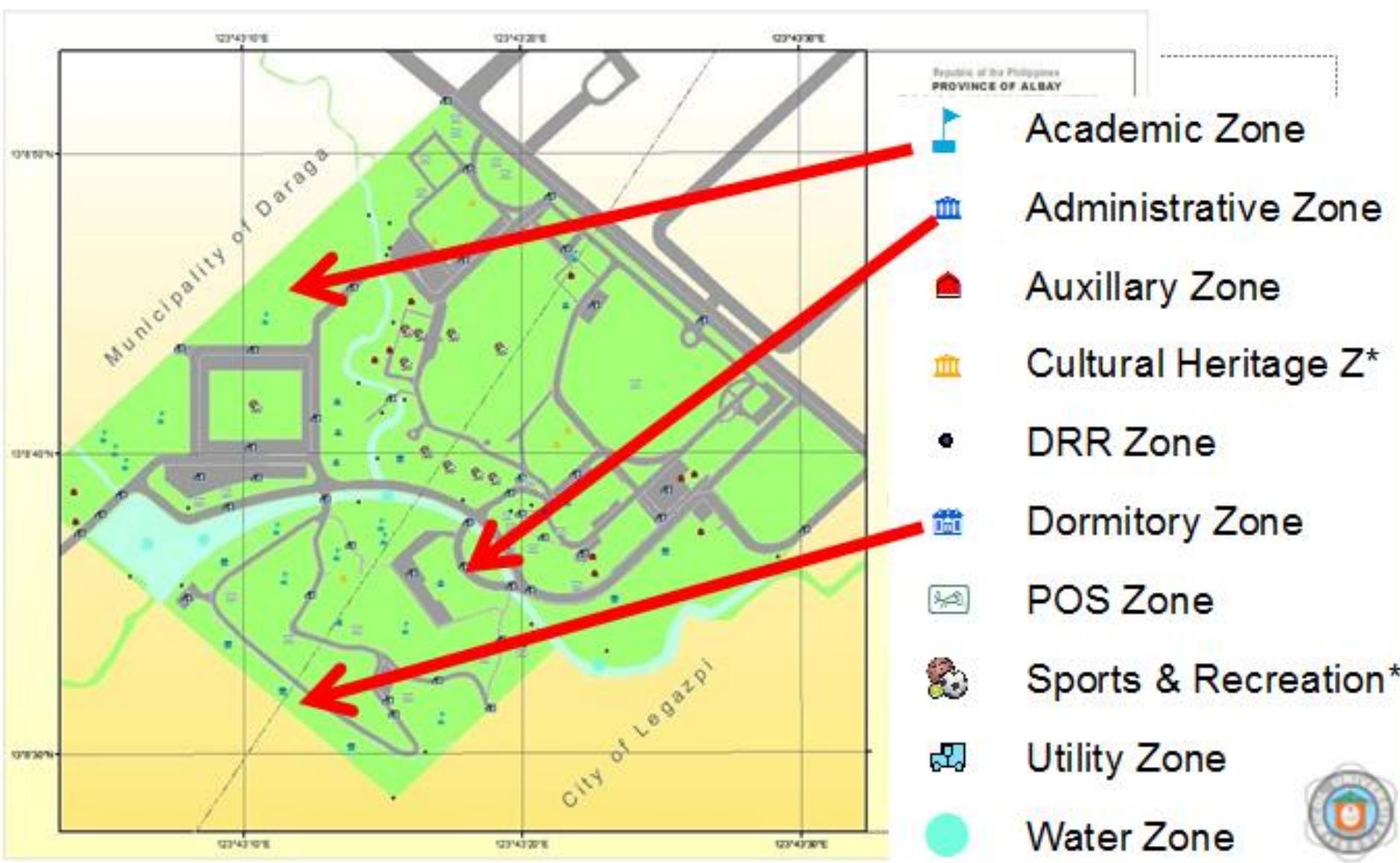
Indeed, land use plan should be made an integral part of over-all institutional development strategy.

Realizing what is contained in this plan is the challenge that the current and future BU leadership should face head on.

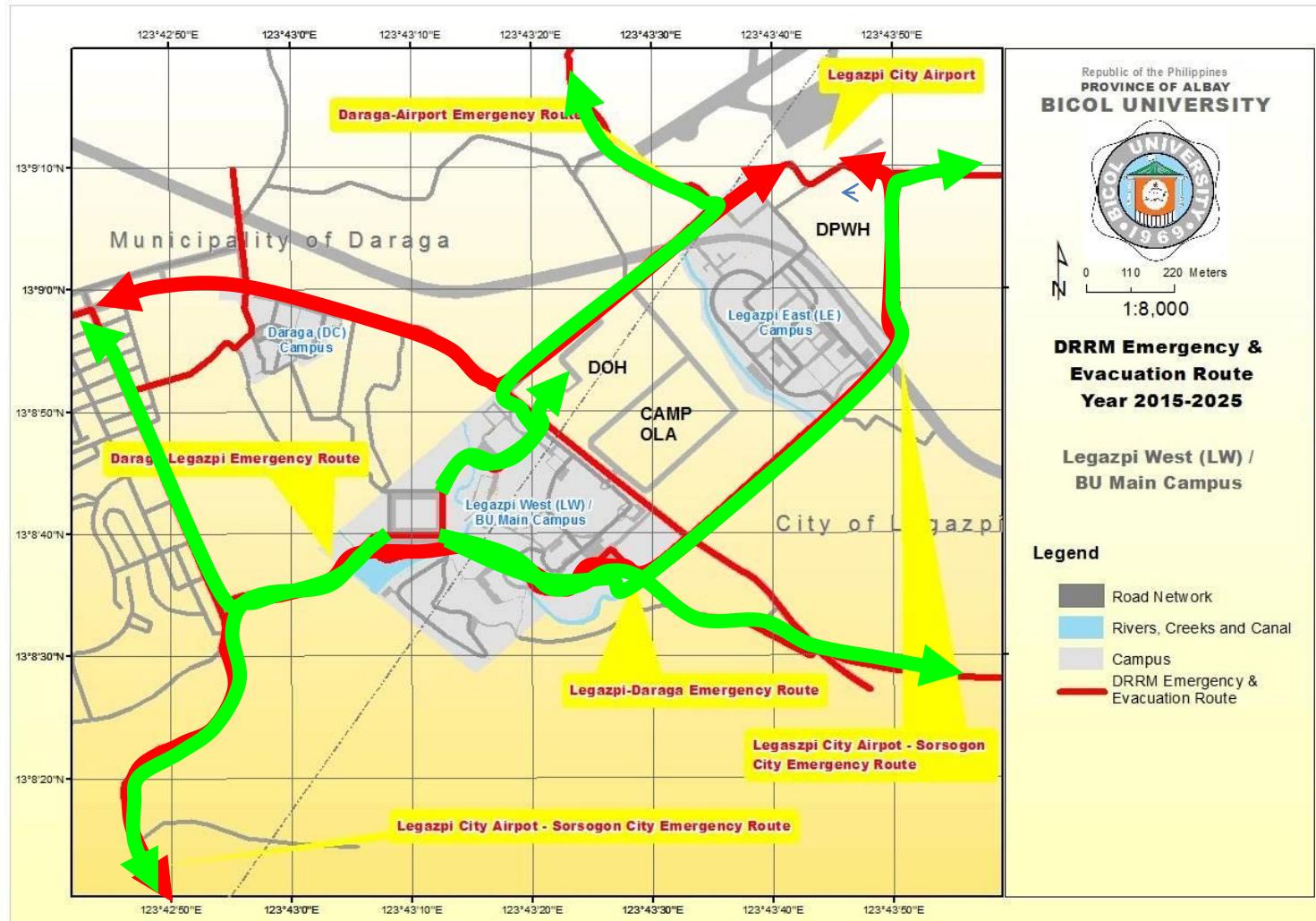


Land Use, Year 2016-2026	Zoning	Land Use, Year 2015	Area (SQM)
Administrative Use	Administrative Zone	Administrative Use	267.45
Administrative Use	Administrative Zone	Ecotrail/Footpath	193.73
Administrative Use	Administrative Zone	Govt. Agencies Occupying BU	528.61
Administrative Use	Administrative Zone	Parks & Open Space	954.43
Administrative Use	Administrative Zone	River	355.88
Administrative Use	Administrative Zone	Utility Use - Road Network	1651.73
Administrative Use	Administrative Zone	Unutilized Space	8,008.54
CH	CHZ	Academic Use	243.34
CH	CHZ	Cultural Site	6,134.30
CH	CHZ	Parking Area	120.29
CH	CHZ	Parks & Open Space	2,443.45
CH	CHZ	Utility Use - Road Network	51.16
Dormitory Use	Dormitory Zone	Unutilized Space	1,324.40
Ecotrail	Utility Zone	Academic Use	1,008.34
Ecotrail	Utility Zone	Ecotrail/Footpath	21.38

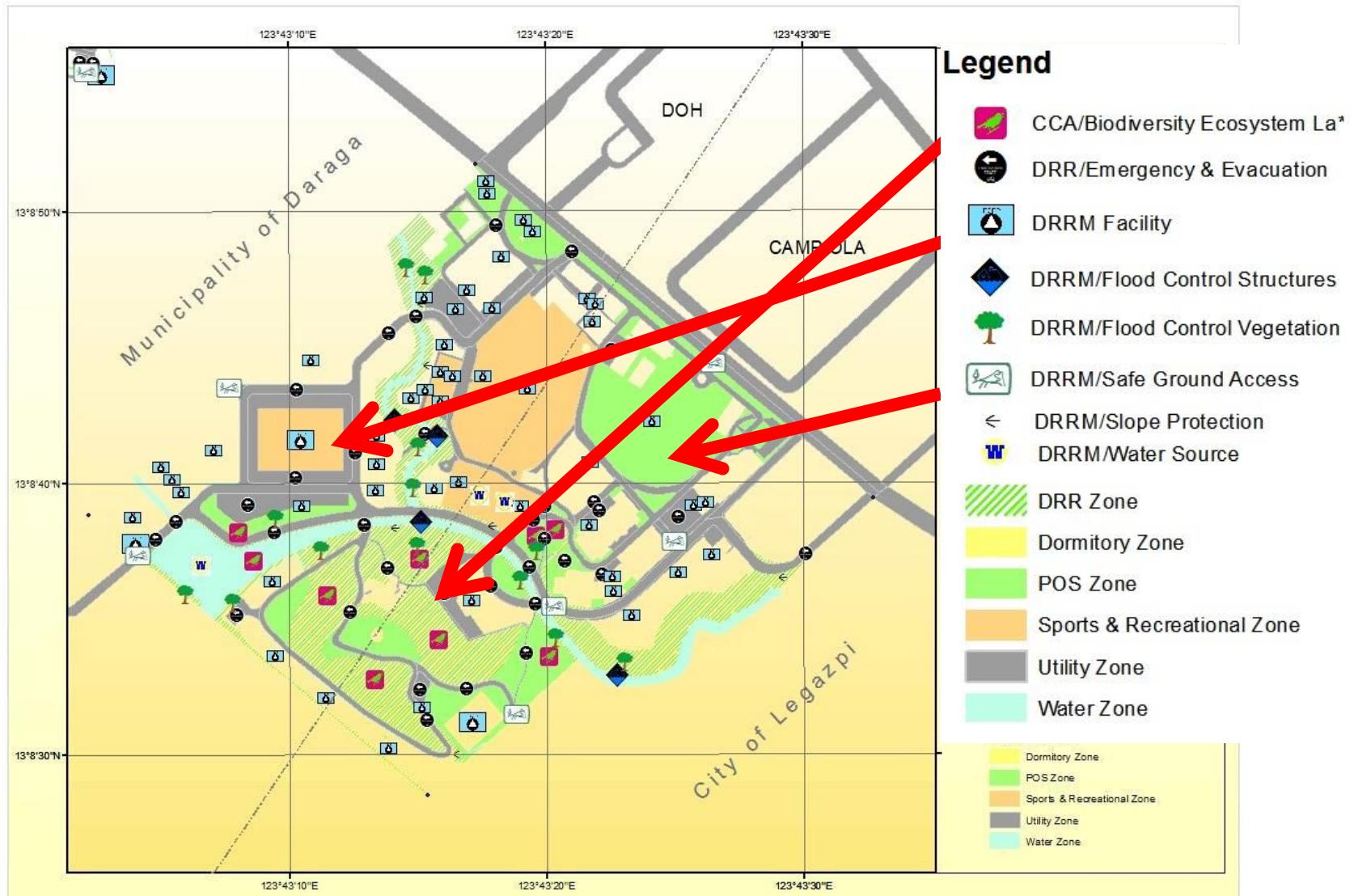
Proposed Major Projects – Campus Facilities



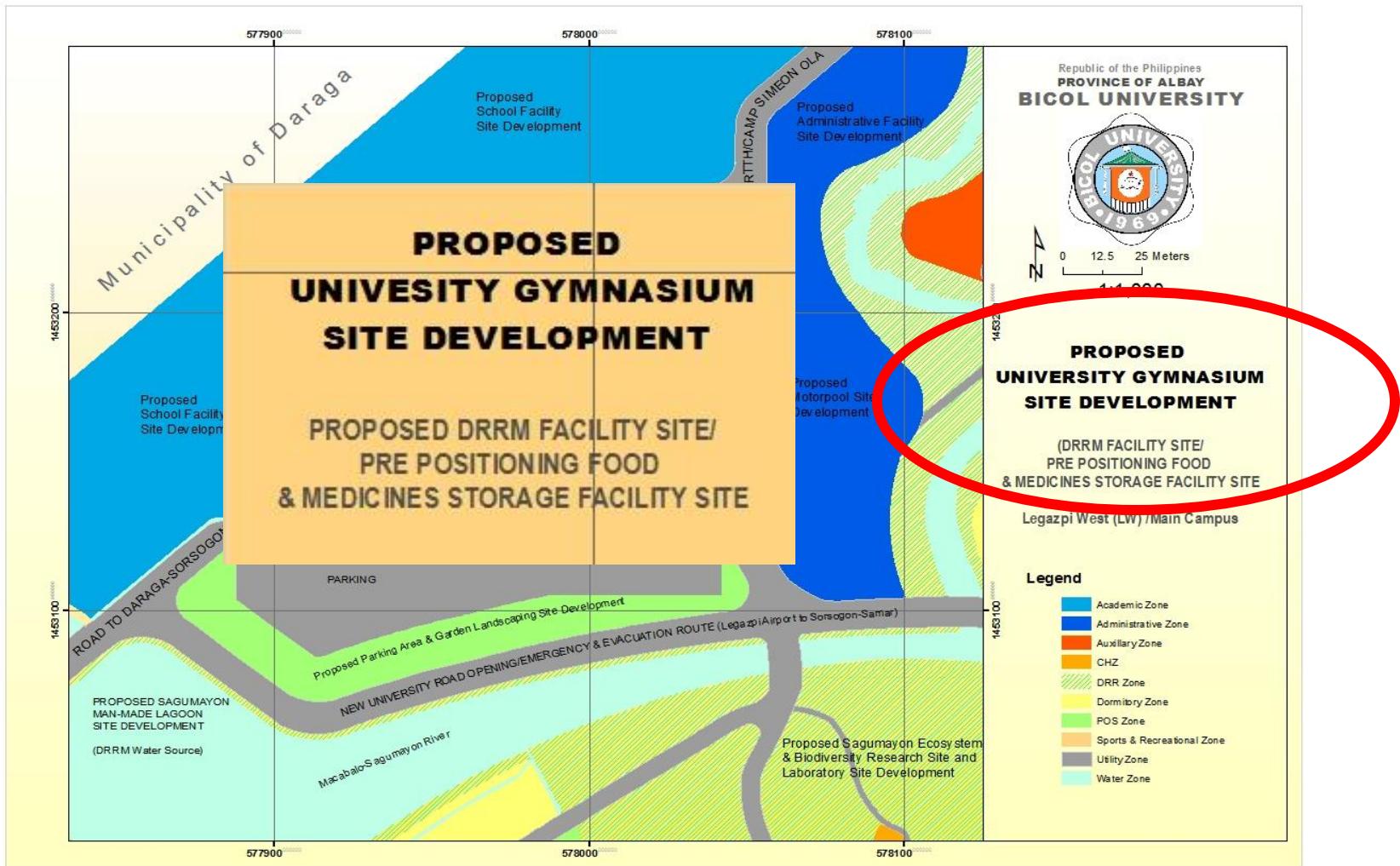
Proposed Major Projects – Campus DRRM Emergency and Evacuation Route Provisions



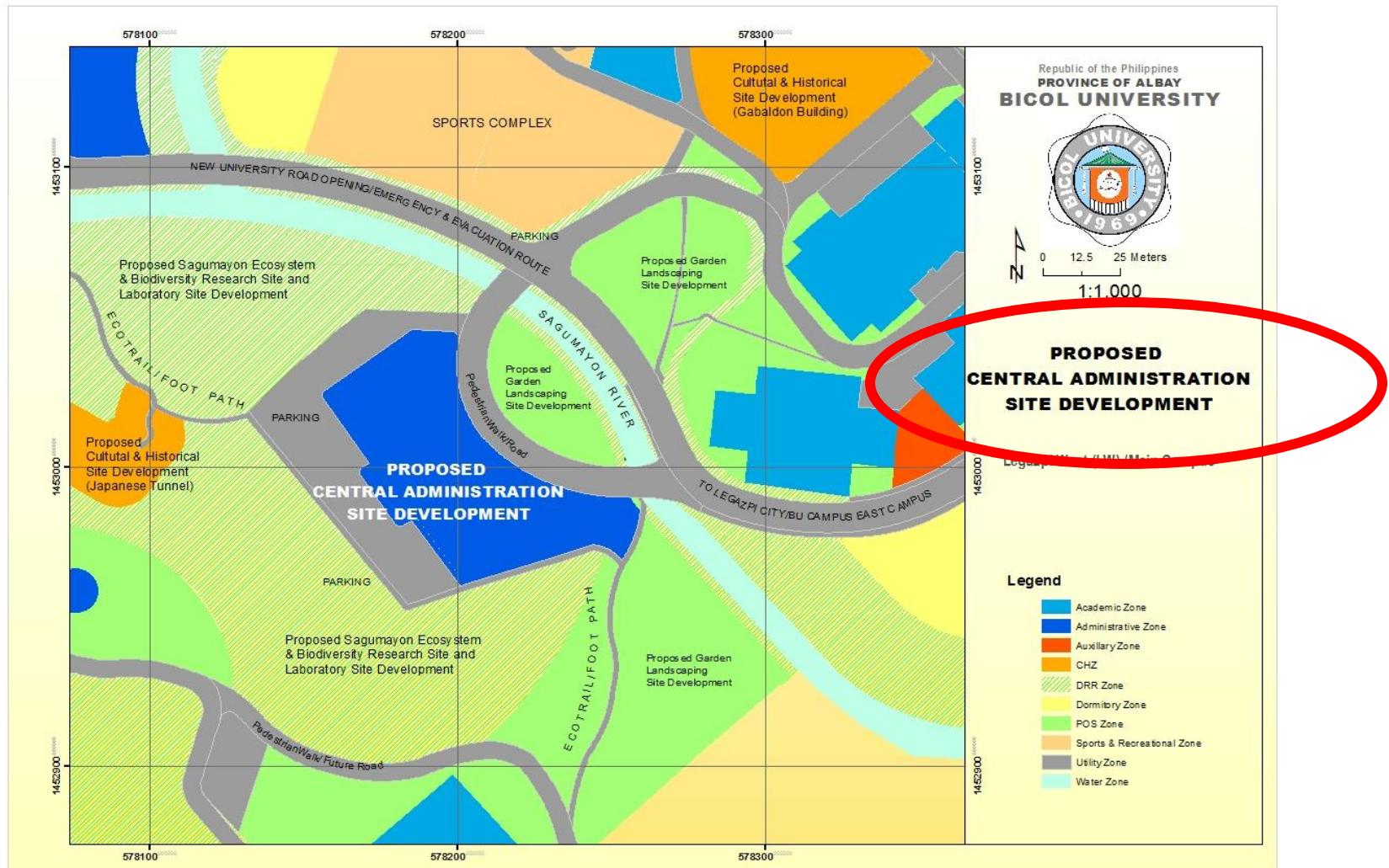
Proposed Major Projects – Campus CCA/DRRM PPAs



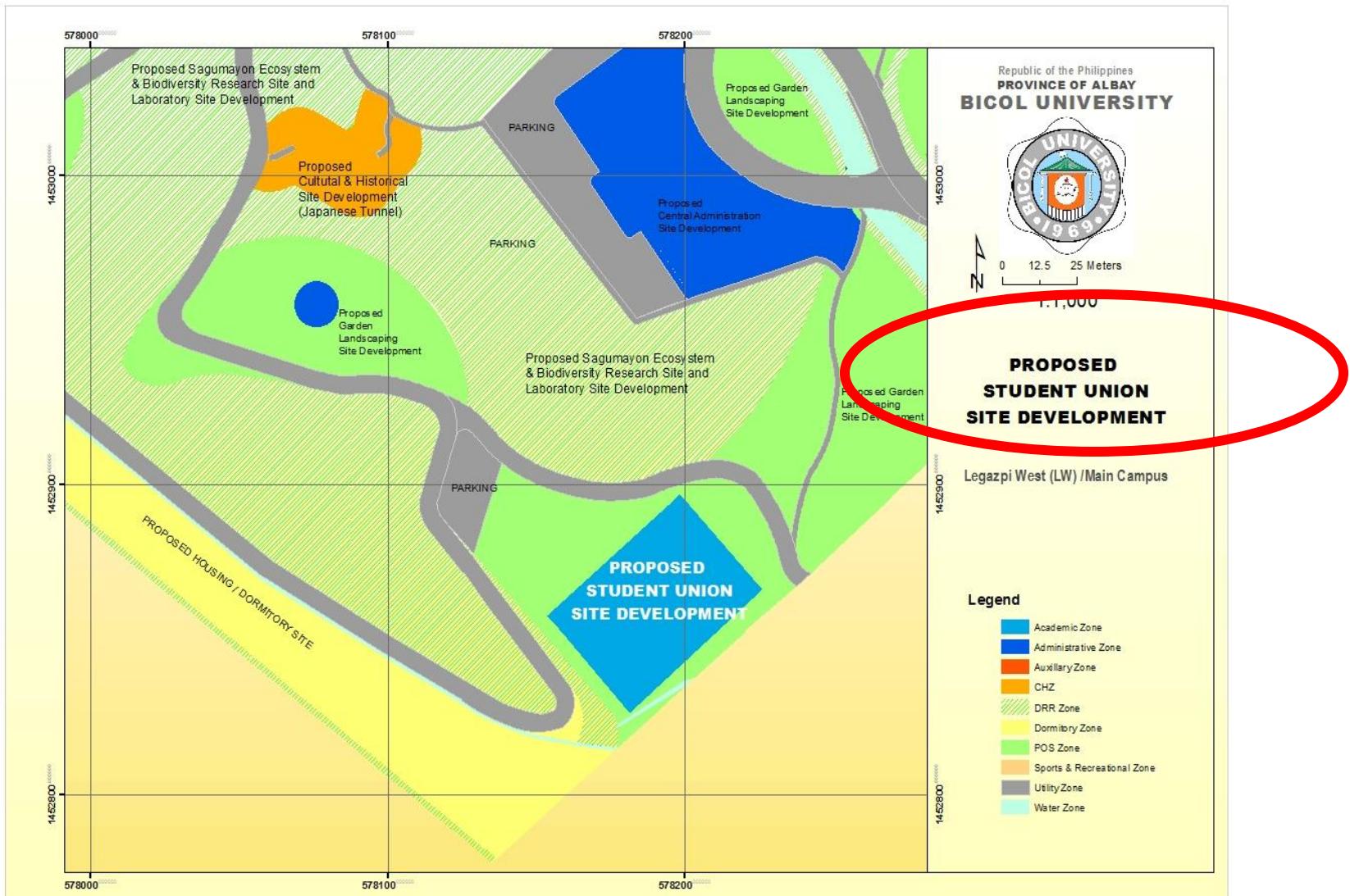
MAJOR PROJECTS



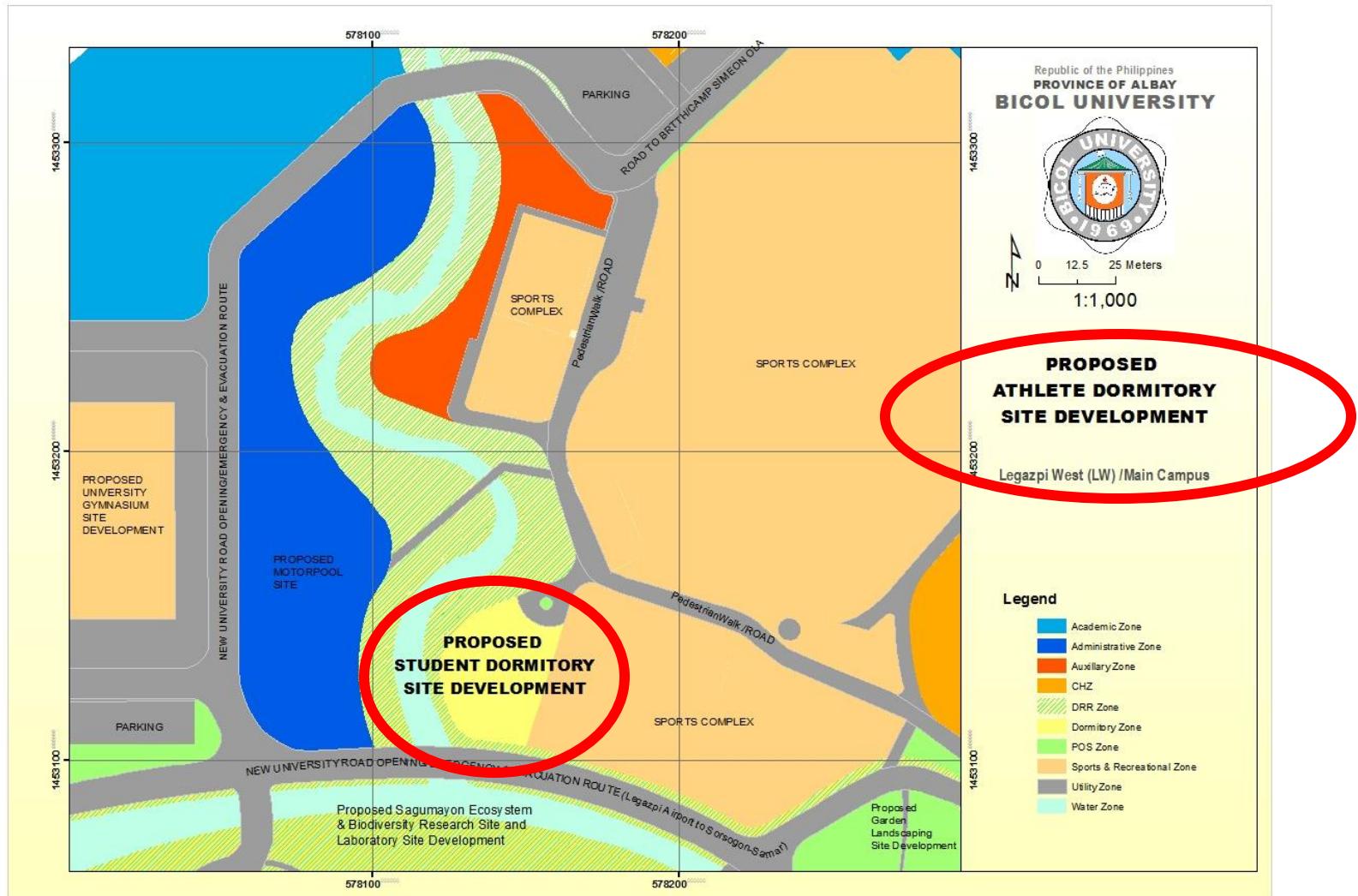
MAJOR PROJECTS



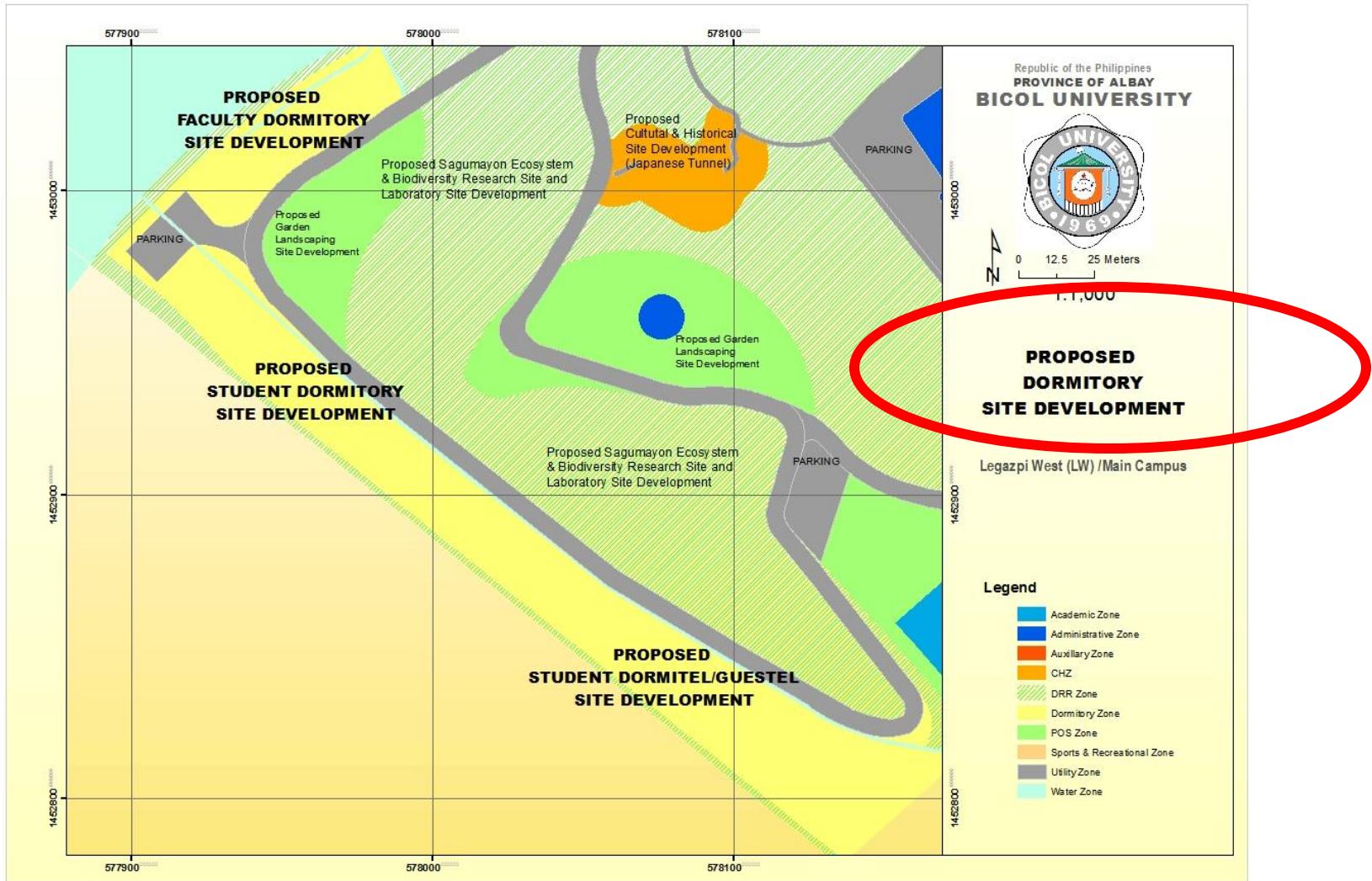
MAJOR PROJECTS



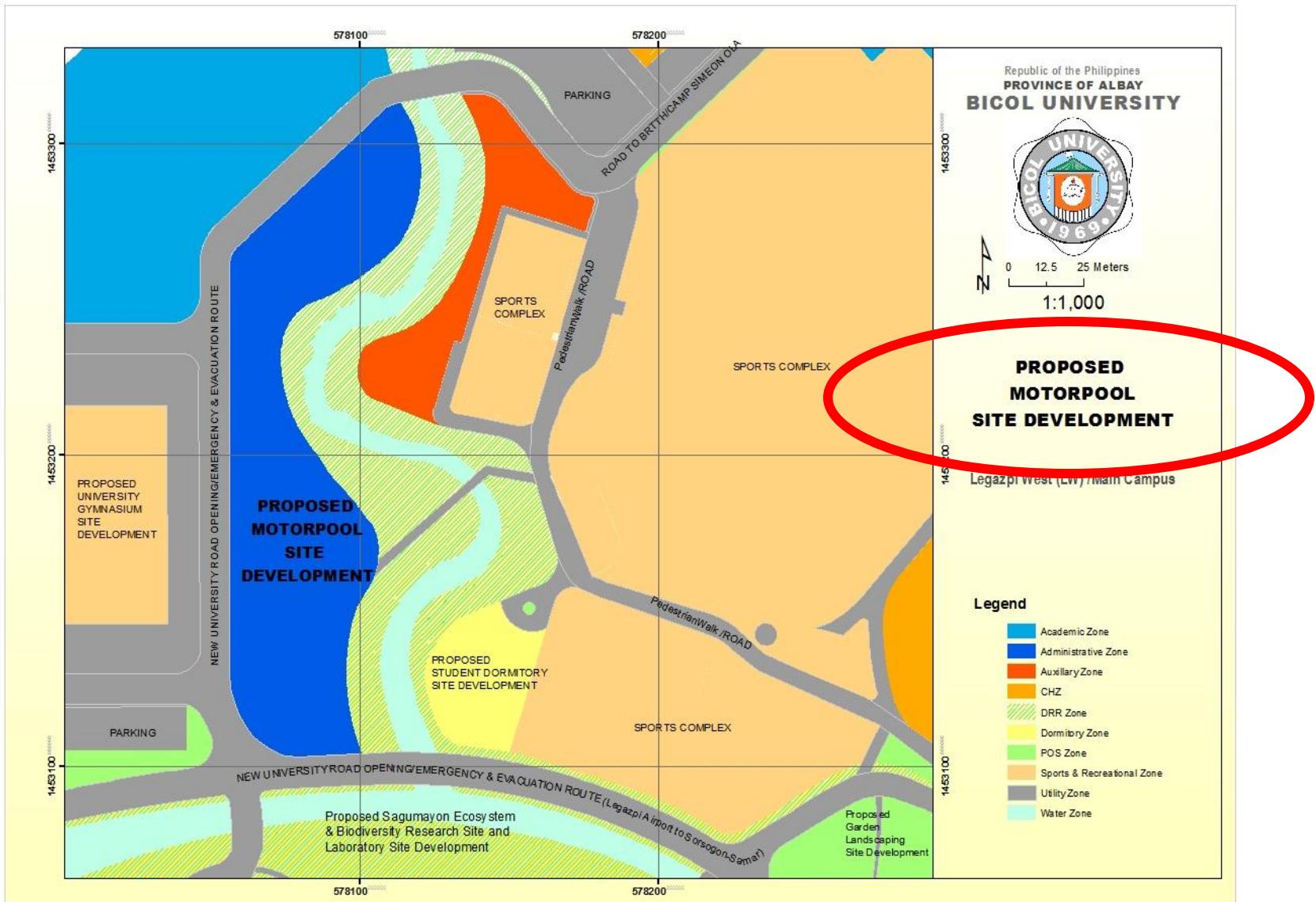
MAJOR PROJECTS



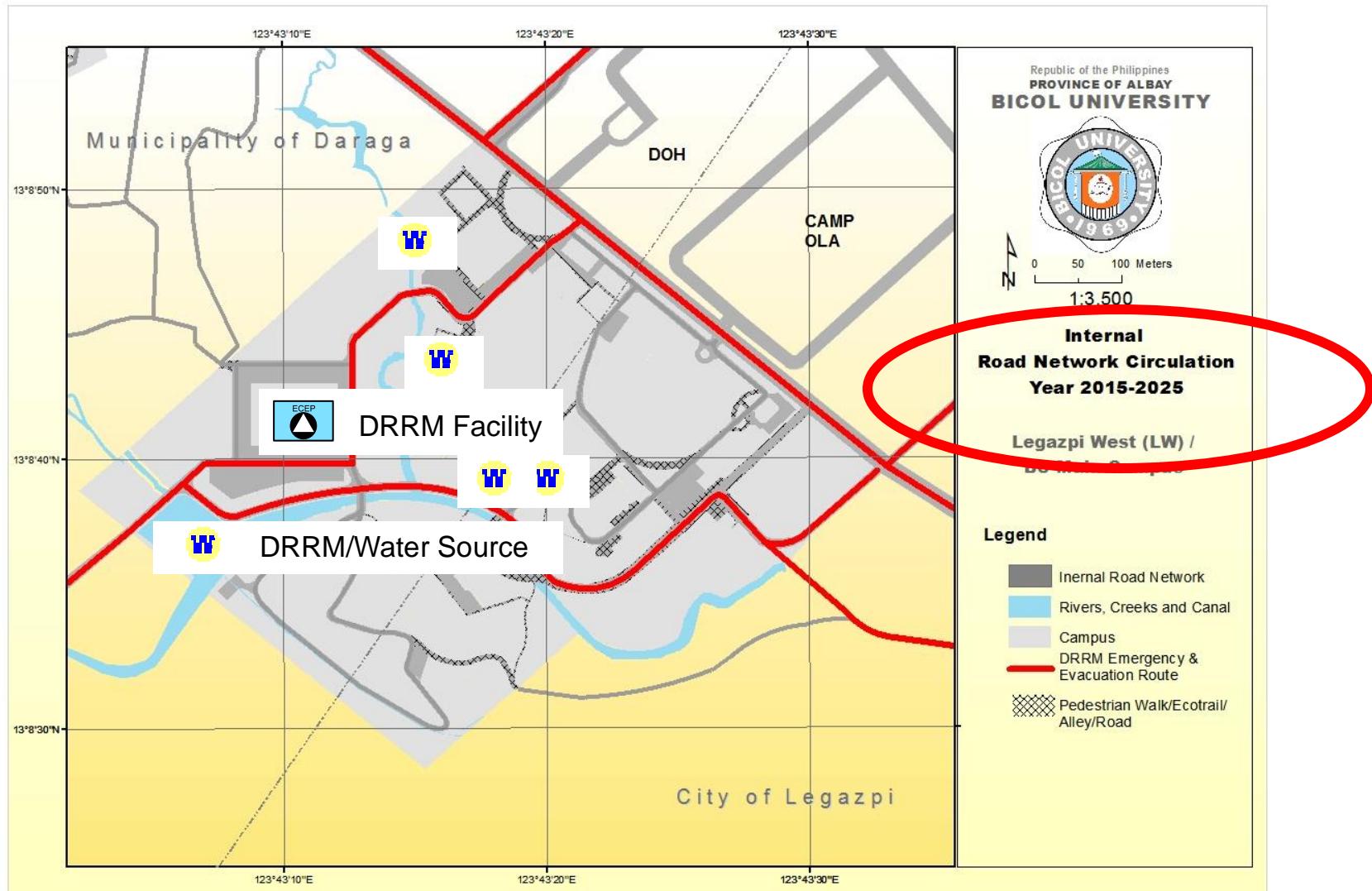
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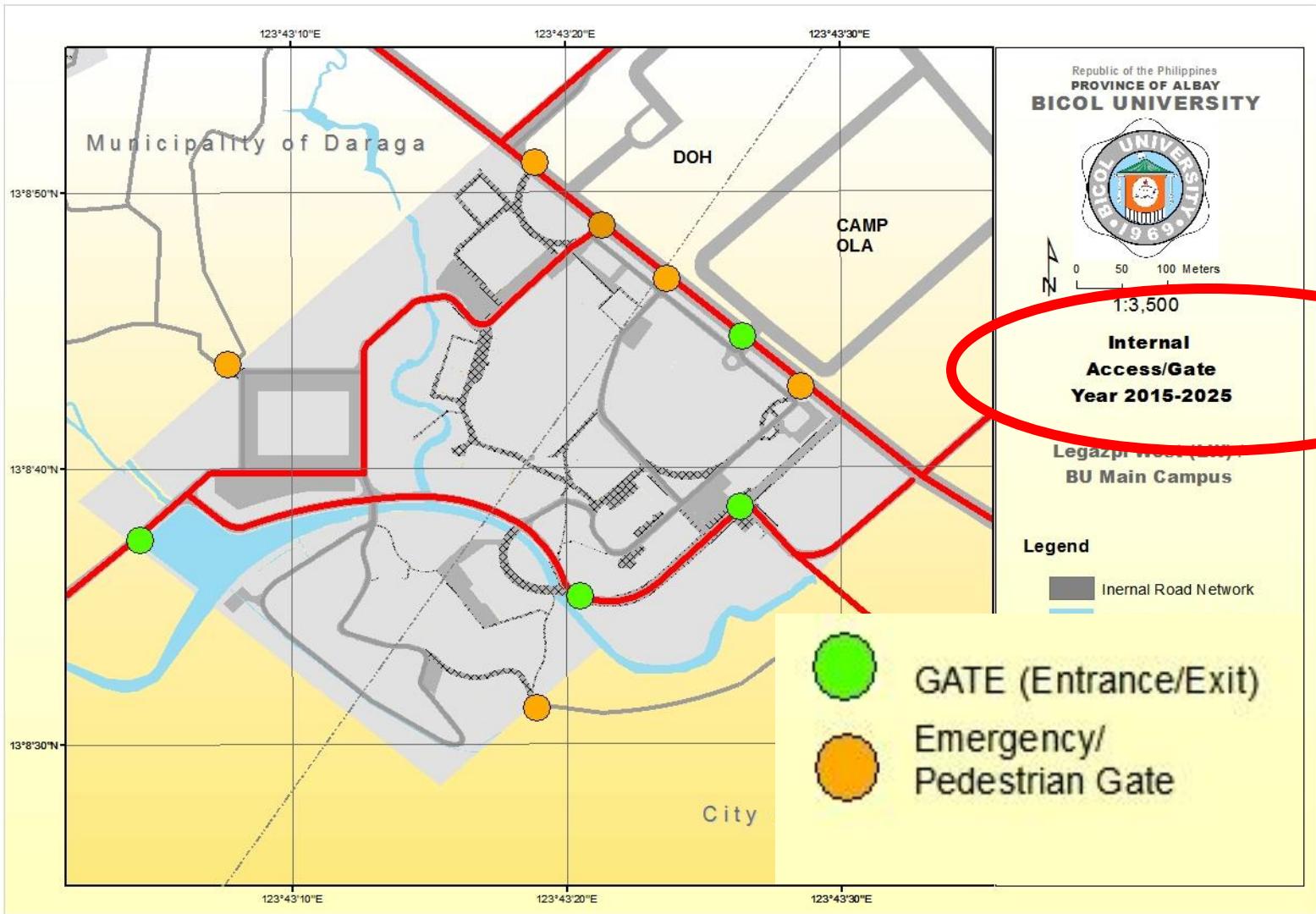
MAJOR PROJECTS



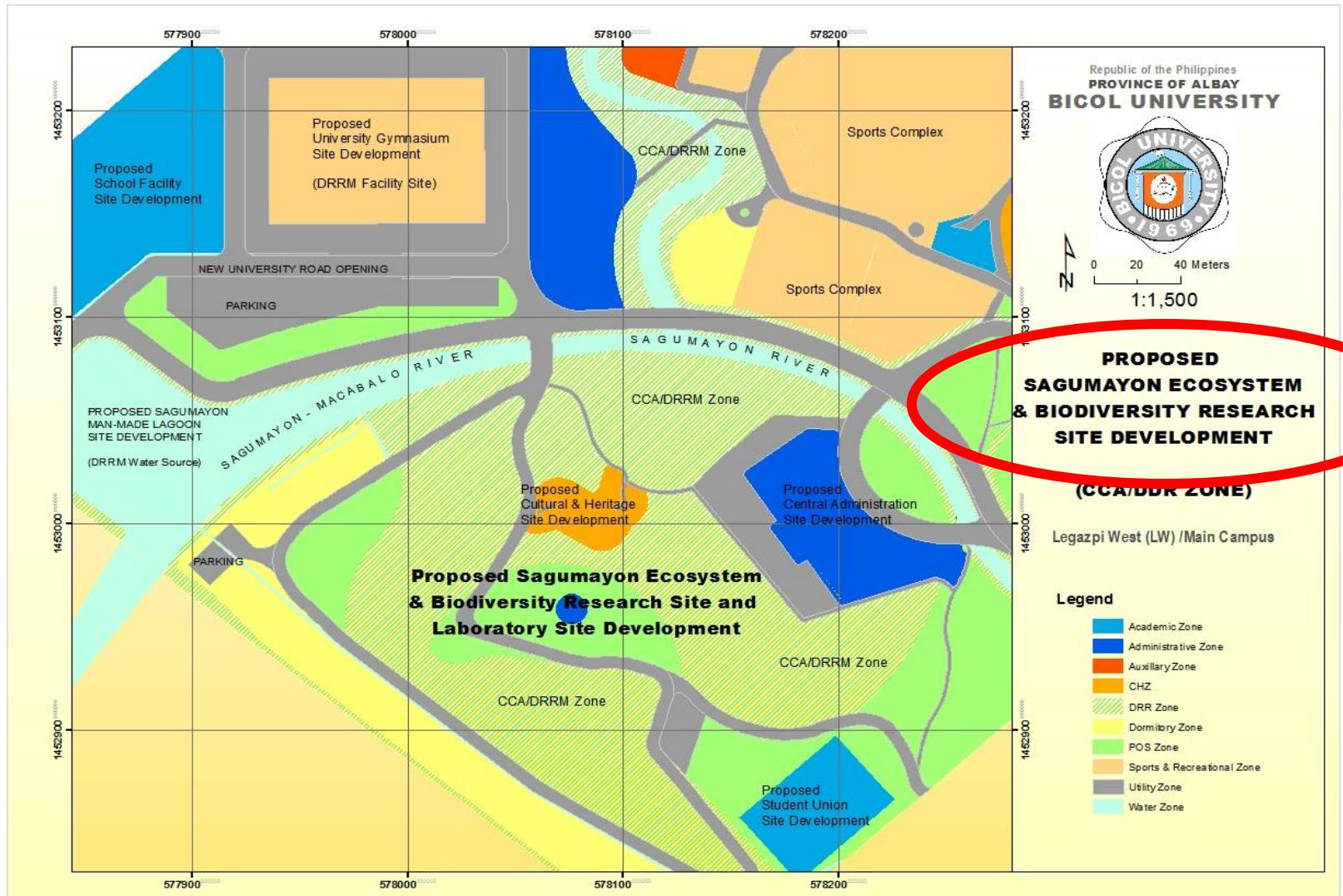
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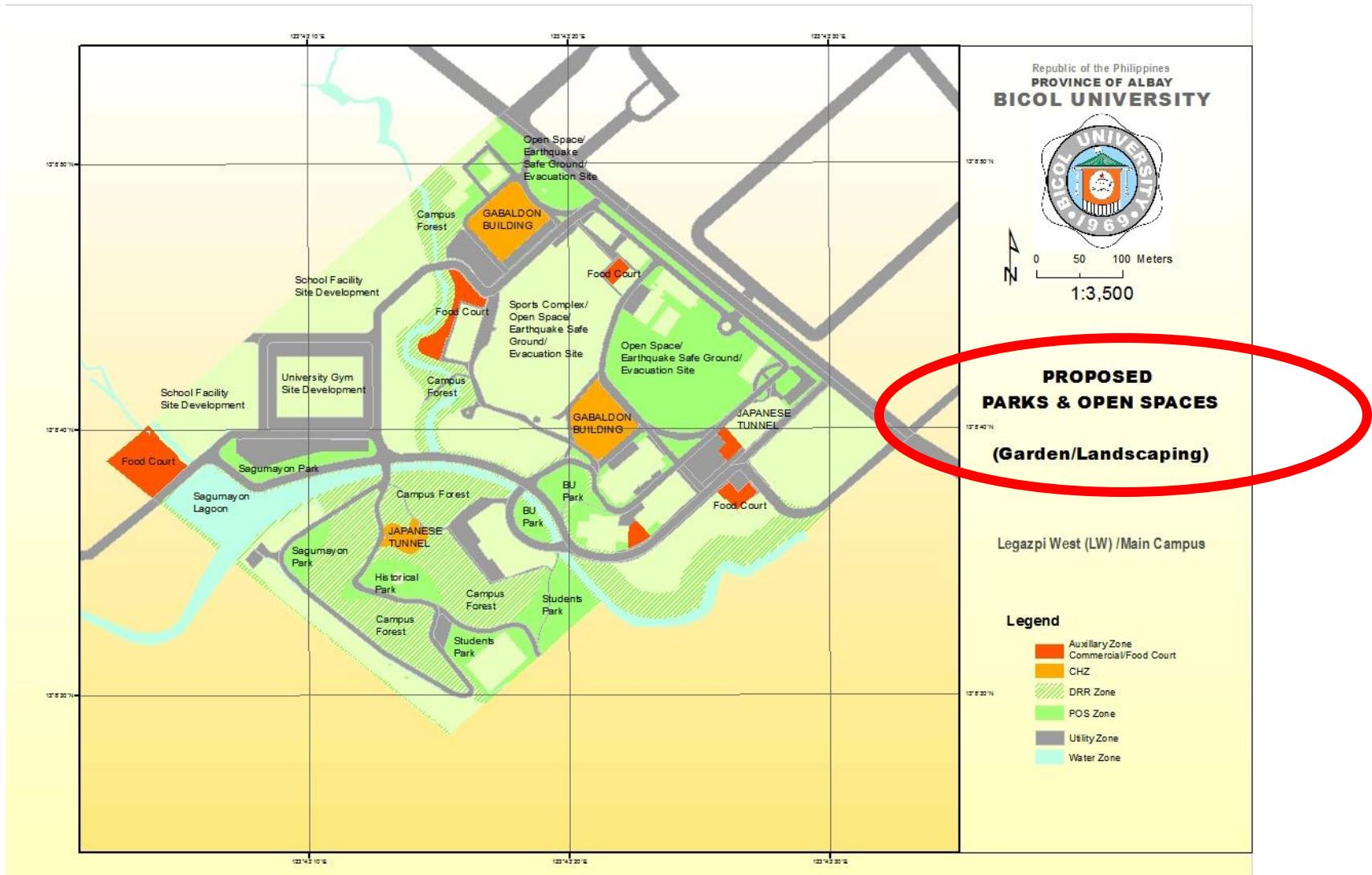
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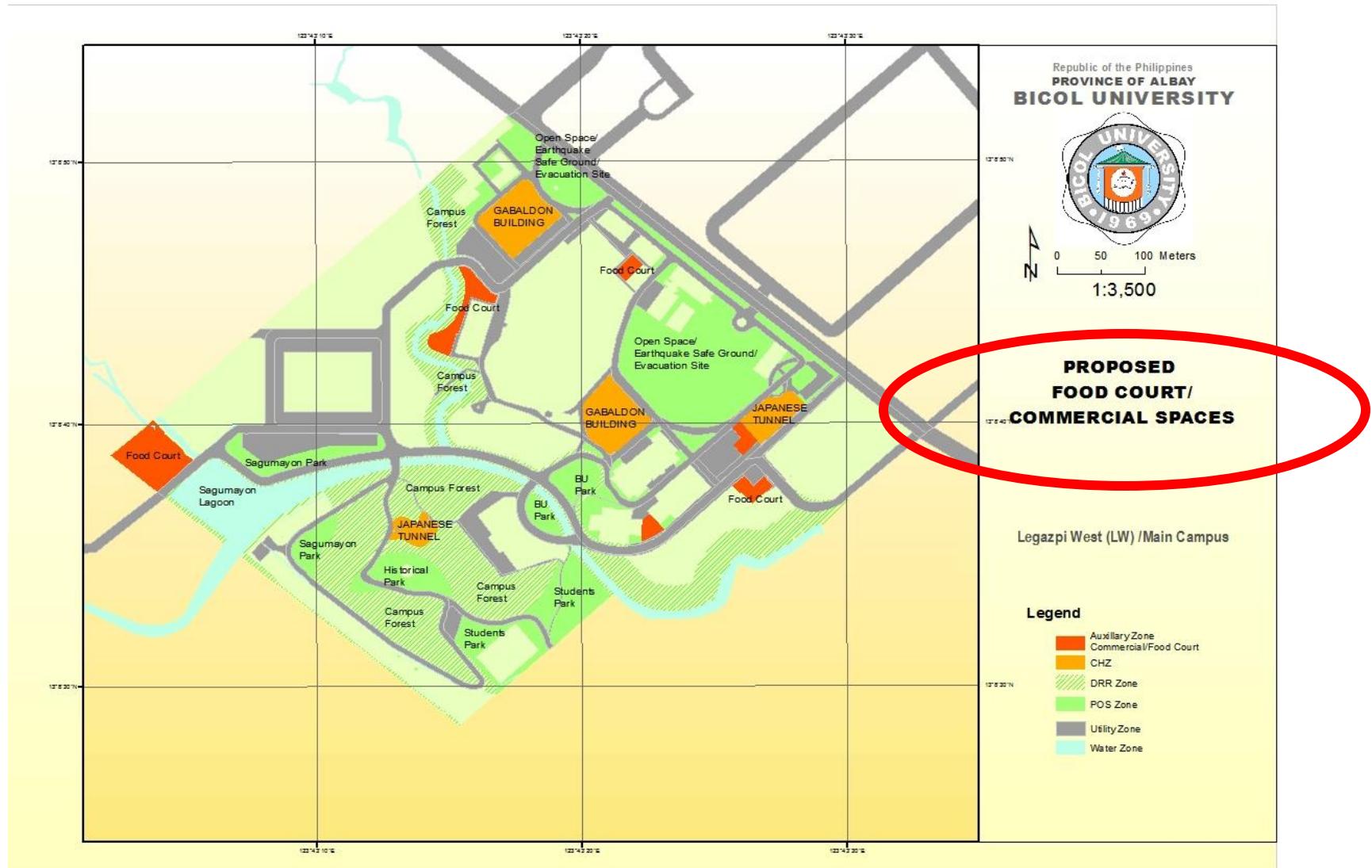
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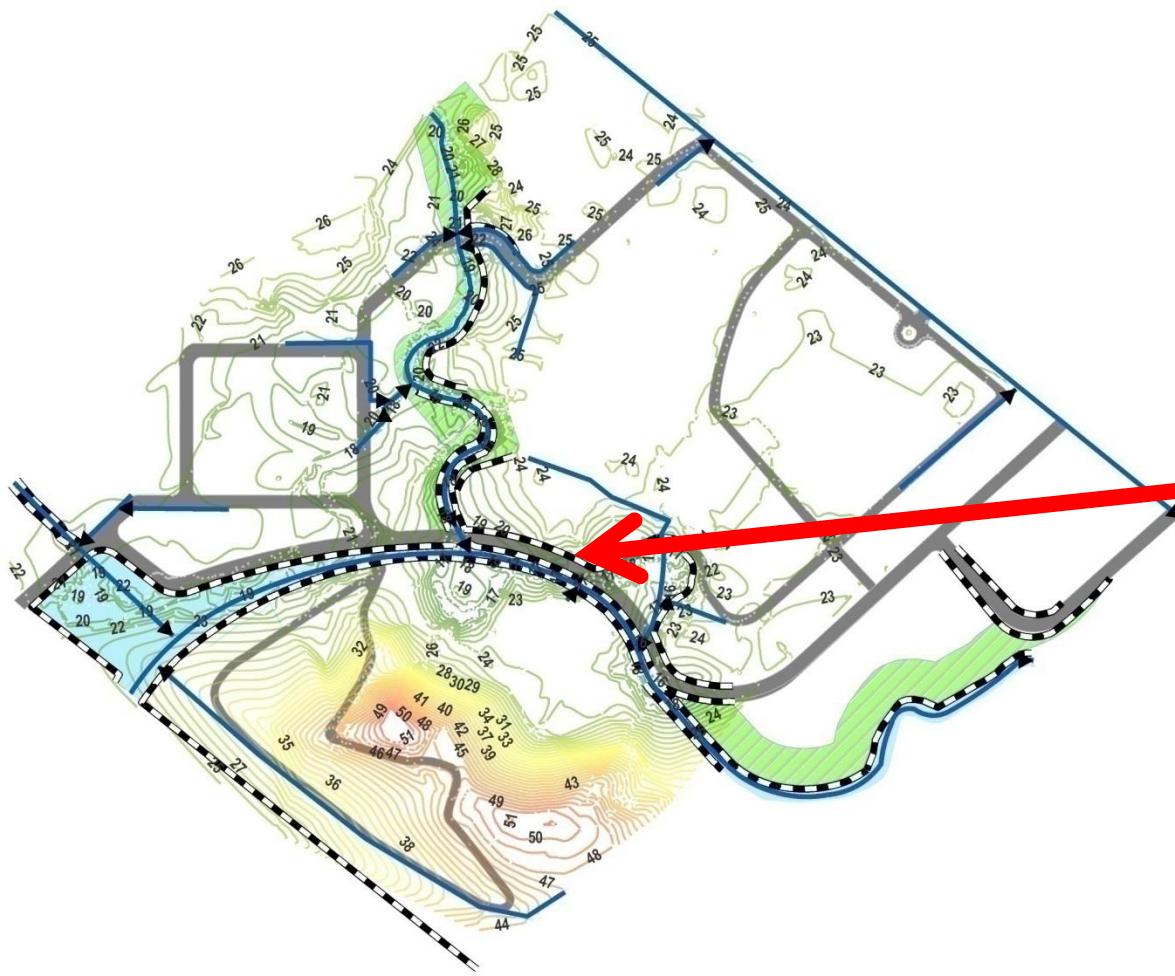
MAJOR PROJECTS



MAJOR PROJECTS

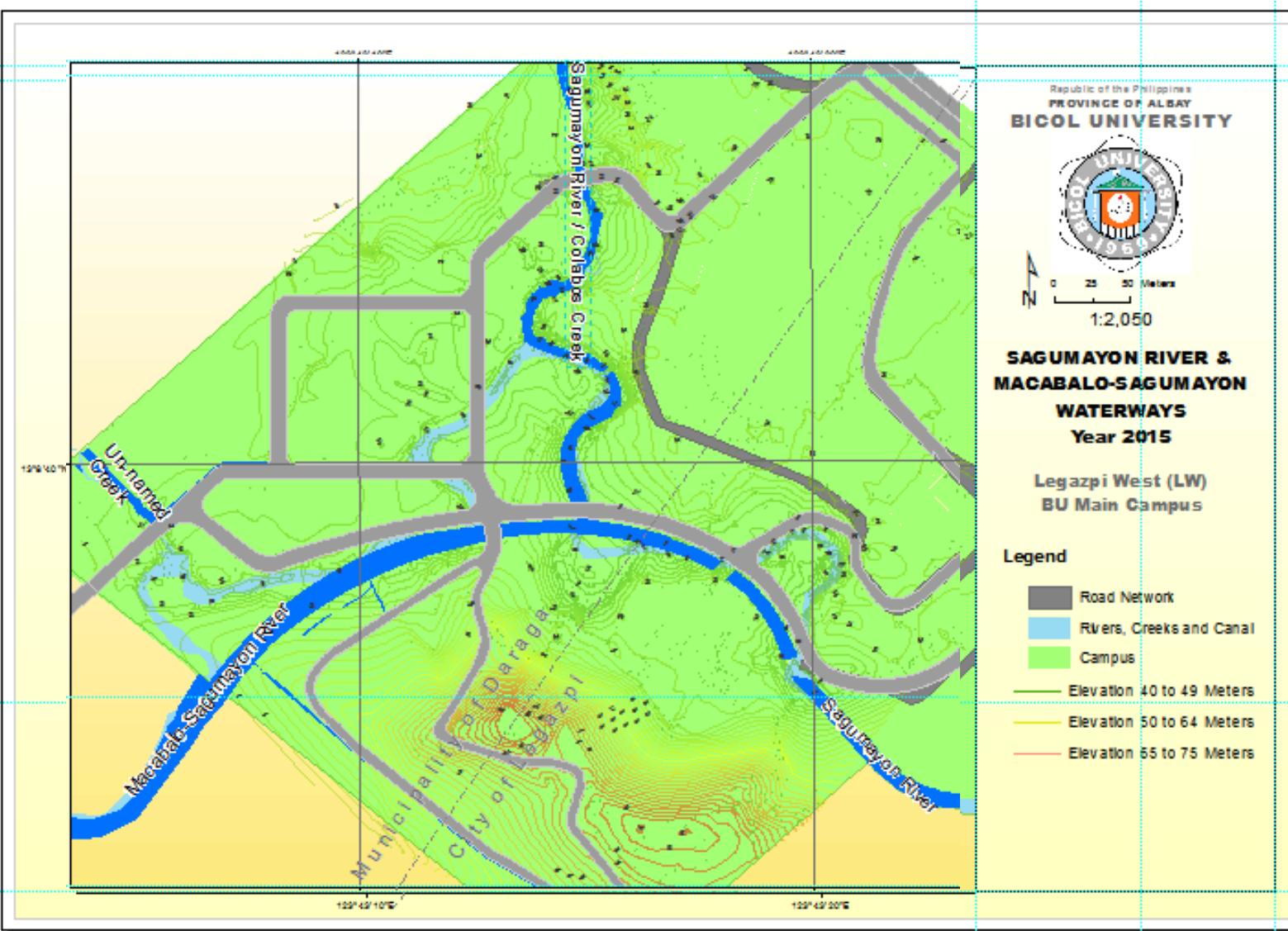


MAJOR PROJECTS



DRRM

Hazard Mitigation Approach



The Zoning, Year 2016-2026

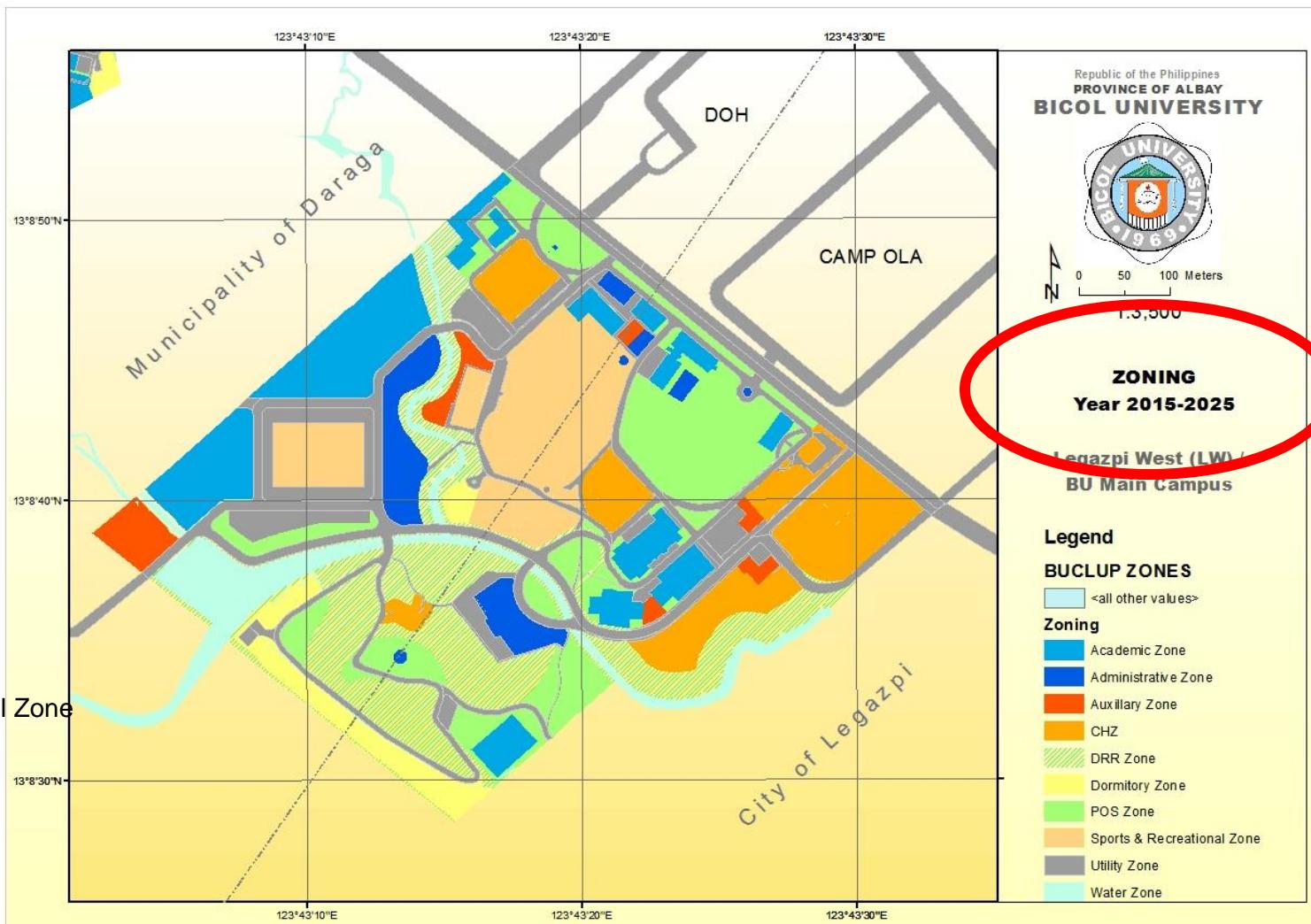
Legend

BUCLUP ZONES

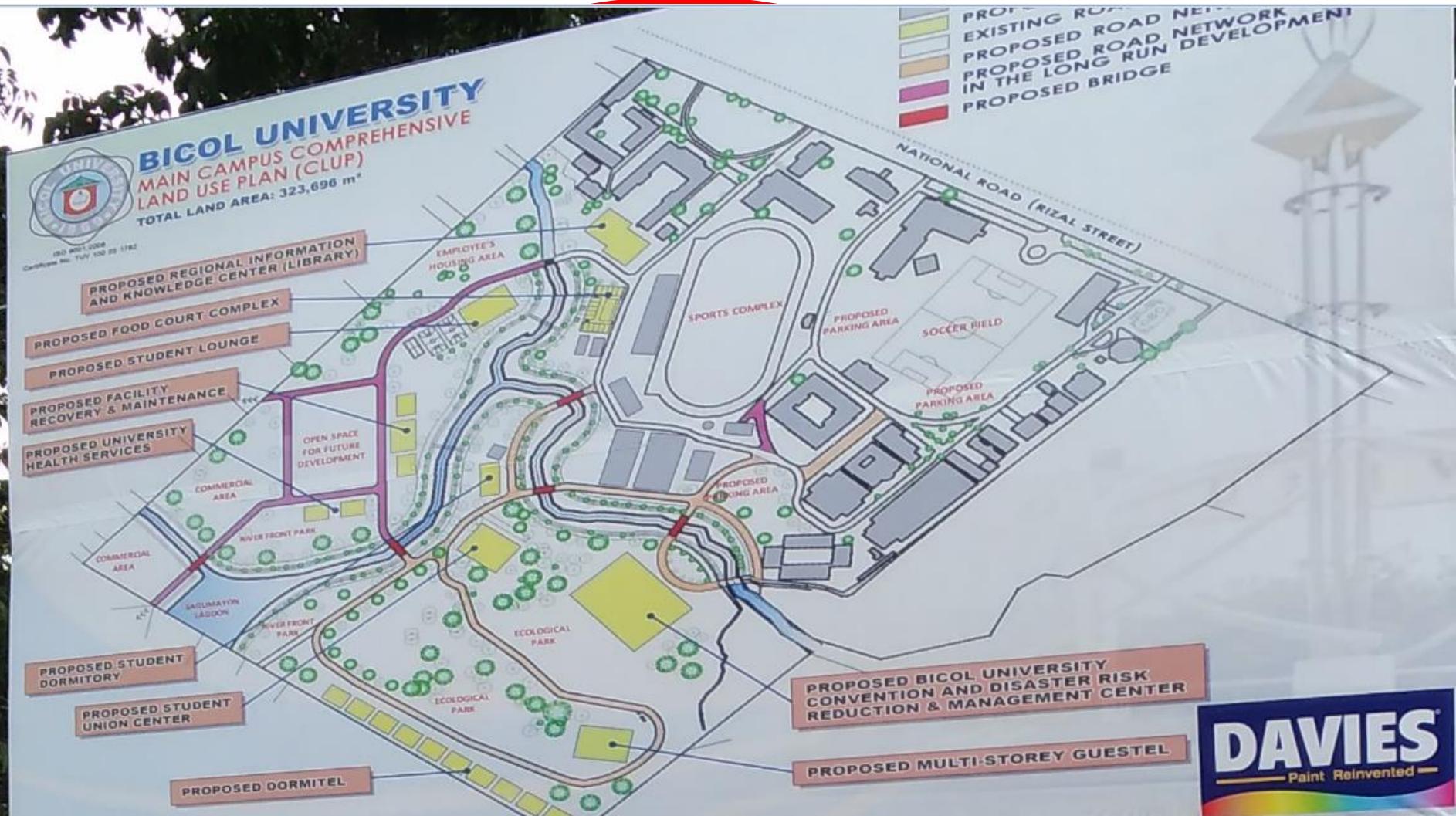
 <all other values>

Zoning

-  Academic Zone
-  Administrative Zone
-  Auxillary Zone
-  CHZ
-  DRR Zone
-  Dormitory Zone
-  POS Zone
-  Sports & Recreational Zone
-  Utility Zone
-  Water Zone



Implementation of BU CLUP



Implementation of BU CLUP



Implementation of BU CLUP



Implementation of BU CLUP



Implementation of BU CLUP





Thank you for
listening!