# CHANGE DETECTION OF LAND USE MAP OBTAINED BY GIS

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**ABSTRACT:** This study was carried out with refer to the previous study of change detection using GIS in our laboratory. Haneda Airport was selected as a target area in Japan. Recent years, facilities of the airport have been extended for the internationalization. We intended to analyze land use changes in the airport. Non-officials are unable to enter parts of the airport. We could validate the usefulness of remote sensing to investigate such area. In this study, we have created two land use maps to compare the images of two periods. Comparing the land use maps, we carried out change detection precisely by using GIS and remote sensing. As a result, we found that GIS helped us to create a land use map. It is easy to find the change locations. We also found that GIS helped us to investigate the target area.

## 1. INTRODUCTION

If you are planning in overall urban planning and city planning, need to understand exactly what the status of land use change. Previously examined using a map or had to go directly to the site. Remote sensing technology has evolved so recently, it was able to land on the interpretation of satellite image. Using it, I thought trying to create a land use map. With the creation of GIS in land use can be flexibly respond to changes in widespread use. The purpose of this study is to create a land use map from satellite images using GIS. We chose a target area in Haneda Airport. There can't be accessed only by the public. Becoming increasingly international in recent years, with enhancements that go the airport. Just thought it a good place to ascertain the usefulness of remote sensing technology can be accessed only in the region.

## 2. METHODOLOGY

In this study, two or more satellite images that photographed in a different year are prepared, and contrasted. We selected Haneda Airport as a research object in order to prove the utility of remote sensing in an area where direct survey cannot be done, we selected Haneda Airport as a research object. We could get satellite images in the vicinity of Haneda Airport to obtain cooperation by Japanese Space Imaging Ltd and Hitachi Solutions Ltd. These images taken in Satellite IKONOS and Satellite QuickBird. Original images according to satellite cannot be made visible in a true black, it is necessary to process these images. First, one of images is compressed from 11bit into 8bit and corrected image level to visualize by Photoshop. After that, it draws to the layer in this image by ArcMap and the same work to do the other image. Fig.1 and 2 are the result of processing.

Fig.1 Haneda Airport 2002                                    Fig.2 Haneda Airport 2010

After that, to define each item of the land use, the data that could be read from these images is divided in the group as each space. But, the part where the land use is indistinct has existed because of these satellite images were black and white. Therefore, it referred to the Google Maps to analyze there.





Fig3. Processed image 2002                                    Fig.4 Processed image 2010

This study, we defined the land use items as the table.

| | Land classification ／ Full representation | | Land classification ／ Full representation |
|---|---|---|---|
| ● | Tollgate | ▦ | Warehouse |
| ▬ | Local roads | ▧ | Tarmac |
| ▬ | Highway | ▨ | Parking |
| ══ | Other roads | ▦ | Greenbelt |
| ▨ | Building cluster | ▦ | Vacant lot |
| ▨ | Maintenance area | ▦ | Buildings being built |

Table.1 Land use categories defined in Table

After working layers, we enclose the changed area with square, and we compare before with after. We found where changed area by changes color to Fig. 5, Fig. 6.
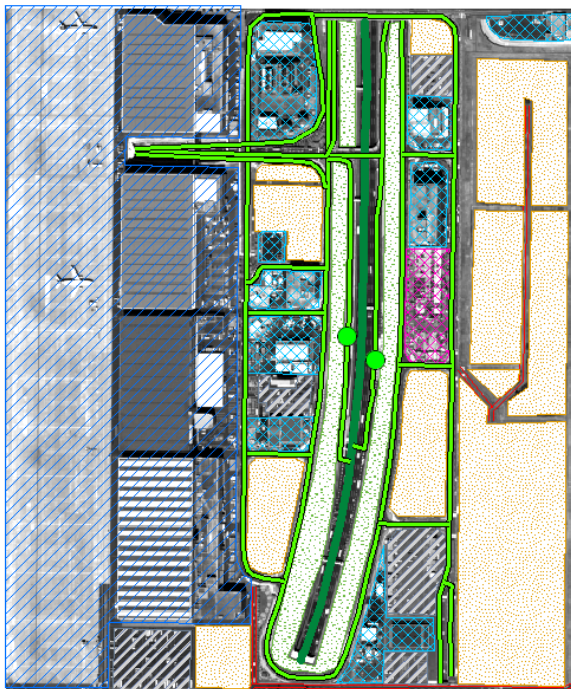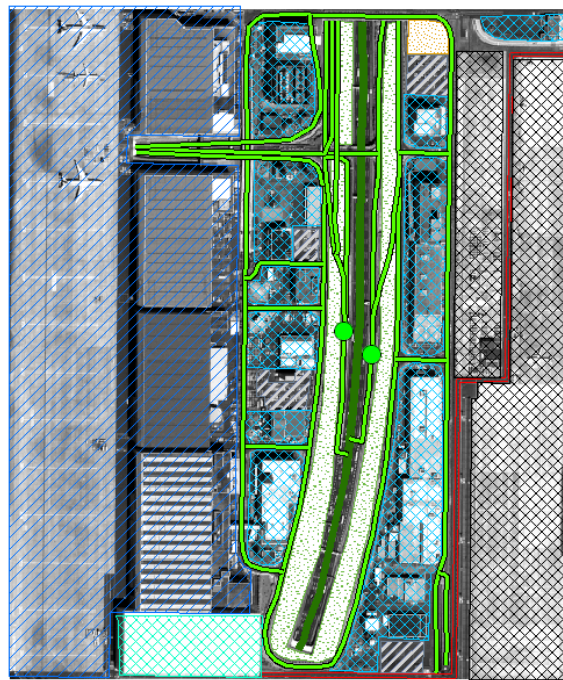


Fig.5 Land use map 2002

Fig.6 Land use map 2010

After comparison, we extract the only layers that are changed. Fig.7 is the result of processing.



Fig.7 Figure detection changes

## 3.  RESULTS

Change detection of Figs. 5 with Fig. 6 is Fig. 7. Compared with the results in Figs 5 and 6, and the results did not change much with Google Maps. Comparing Fig. 5 and 6, vacant land and parking became some buildings. Tarmac and the buildings that had been under construction were finished. Comparing Figs. 5 and 6, group of buildings is increasing. We inferred that the new facility is needed for airport extension. When the analysis of regional land use her officials enter difficult is said to be effective means of using satellite imagery.

## 4.  SUMMARY AND CONCLUSIONS

Created land use map was visualized as a change of land use information. And, we could analyze development of Haneda Airport. Also, by overlaying satellite images and the detection results, it is possible to view the status of land use. We can find the location to changed point. And we can change it. It is useful to efficiency of create a land use map. We found that it is valid to use satellite image in difficult areas of land use survey research. But satellite images may be seen hiding in the shadow of the building other buildings. Therefore, if you accurate survey, it is necessary to conduct a field survey change detection. Now we couldn't research on target area on guard of airport security. If we same research, we should select as much as easy area. This time, we created land use maps by satellite image.
And we can management the data by ArcGIS. In the future, you need to analyze changes in land cover by high-resolution satellite imagery. Change detection of high-resolution satellite imagery is likely to become increasingly importance. Therefore, we think it would be necessary to develop software to detection the land use change.

## 5. REFERENCES

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