



# Kampala-Jinja Expressway PPP Project

## Phase 1- Historical Analysis Report

prepared for

**Uganda National Roads Authority**

by

**Earth Systems**



**EARTH SYSTEMS**  
Environment · Water · Sustainability

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## 1. INTRODUCTION

This *Historical Analysis Report (HAR)* for the Kampala-Jinja Expressway Project (hereafter ‘the Project’) has been prepared for the Ugandan National Roads Authority (UNRA) by Earth Systems. The Project aims to provide a major toll-road link between Kampala and Jinja to help ease congestion along the existing Kampala-Jinja road and to improve the transportation infrastructure in Uganda and East Africa. Large infrastructure projects can have detrimental effects on biodiversity – an aspect of the environment which should be considered at all stages of Project implementation under both Ugandan legislation and International guidelines (e.g. IFC PS6, IFC Environmental, Health, and Safety Guidelines for Toll Roads).

### 1.1 The Project

UNRA is proposing to construct a limited access tolled expressway between Kampala and Jinja to relieve the current congestion on the existing Kampala to Jinja highway and to cater for future growth. The Kampala-Jinja Expressway (KJE) PPP will be complemented by the Kampala Southern Bypass (KSB). Together they will form part of an international highway connecting Uganda to the port of Mombasa on the Kenyan coast and serving as a primary transportation corridor of imports from Kenya and Uganda to the rest of the East African community.

The KJE Project is planned to be undertaken in two phases:

- ▶ Phase 1 includes the Kampala-Namagunga (33.6 km) section of the Kampala-Jinja Expressway, expected to be completed by 2021, and the Kampala Southern Bypass (18 km) which is expected to be completed by 2023; and
- ▶ Phase 2 includes the Namagunga–Njeru (43.4 km) section of the Kampala-Jinja Expressway. Works for this second phase are anticipated to be completed by 2030.

The KJE Project is currently planned for a 30-year term, inclusive of the construction period, after which Project facilities will be transferred to UNRA. The KJE Project is expected to generate up to 1,500 jobs during construction and 250 jobs during operations, most of which will be taken up by Ugandans. Once operational, the expressway is expected to save up to 70 minutes of journey time between Kampala and Jinja. Phase 1 of the Project passes from near Lugogo in Kampala City along the existing Kampala-Jinja road up to Kyambogo. Near Kyambogo it veers South from the existing road passing the low lying areas near Kinawataka and Kasokoso. These low-lying areas comprise areas of degraded wetland habitat but urbanisation and population growth mean that many of the areas passed by the road in the city are heavily settled. The road then passes to Bukasa and crosses the Namanve wetland before crossing areas of subsistence agriculture, rural settlements and shrubland habitat before reaching Namagunga.



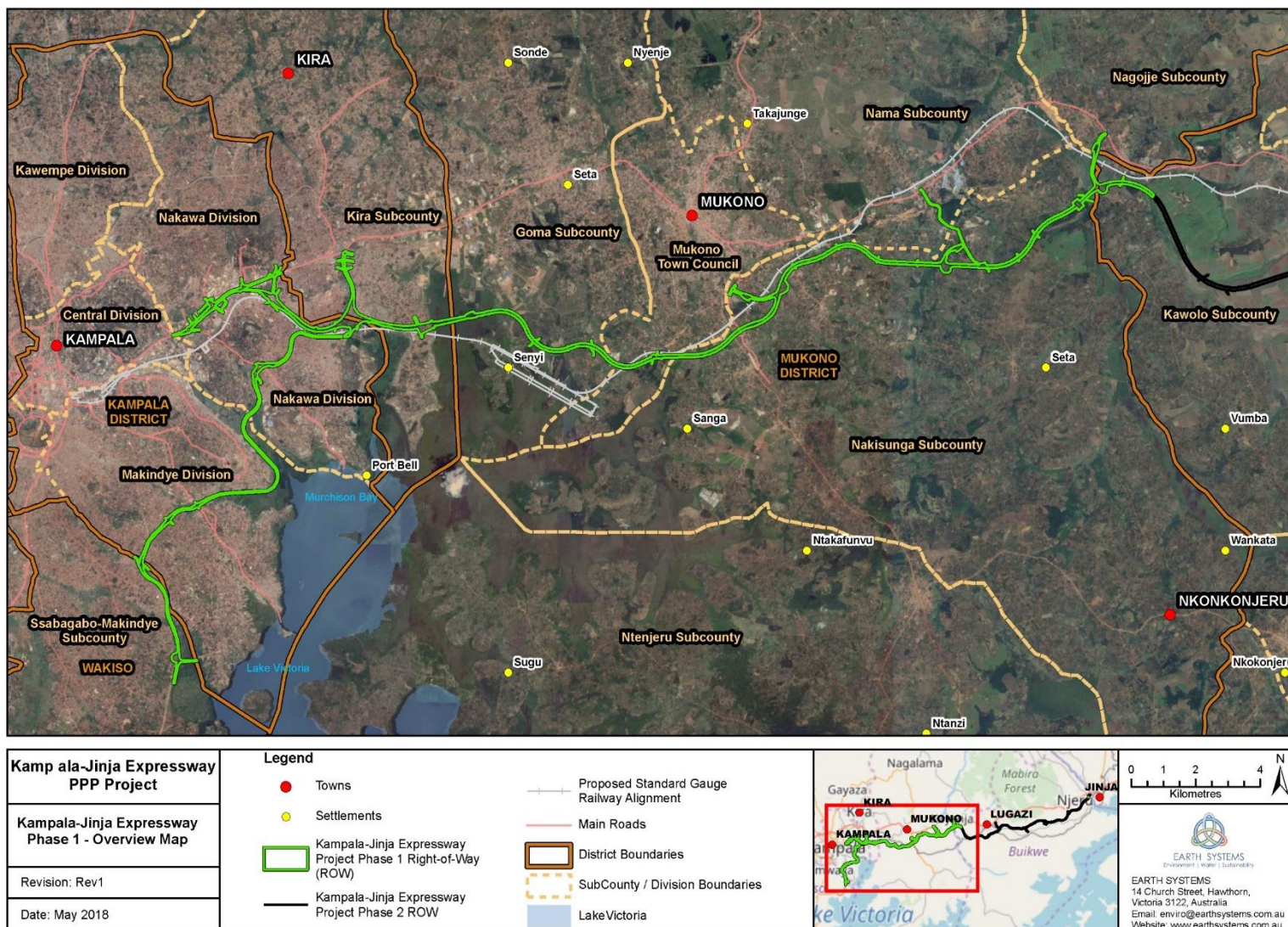


Figure 1-1 KJE Phase 1 Project Area

## 1.2 Objectives and Methodology

The objective of this appendix is to provide a historical profile for the land use of the areas surrounding the Project. The Historical Analysis Report aims to give a comprehensive overview of both the speed and degree in which land use has changed within the surrounding area. This report was completed through the use of Google Earth's time-lapse feature using the following methods:

- ▶ Screenshots were taken at every second kilometre marker for the KJE Mainline;
- ▶ Screenshots were taken at major changes in land use along the KSB Mainline;
- ▶ The year chosen was based on the quality of the image provided; and
- ▶ The land use change was assessed for each section.

## 1.3 Report Author

The Historical Analysis Report has been prepared by Earth Systems. The contact details for Earth Systems are as follows:

Contact:	
<b>Address:</b> Earth Systems Melbourne Office 14 Church Street, Hawthorn Melbourne Victoria, Australia 3122  <b>Email:</b> <a href="mailto:enviro@earthsystems.com.au">enviro@earthsystems.com.au</a> <b>Web:</b> <a href="http://www.earthsystems.com.au">www.earthsystems.com.au</a>	<b>Address:</b> Earth Systems Rwanda Office Business Heights Centre, 260 Boulevard de l'Umuganda, Kacyiru, Kigali, Rwanda  <b>Email:</b> <a href="mailto:enviro@earthsystemsafrika.com">enviro@earthsystemsafrika.com</a> <b>Web:</b> <a href="http://www.earthsystemsafrika.com">www.earthsystemsafrika.com</a>



## 2. KJE MAINLINE

### 2.1 Marker 0+000

The time periods recorded for Marker 0+000 are represented in figures 2-1 to 2-5 and were recorded in the following years:

- ▶ 2002;
- ▶ 2008;
- ▶ 2015;
- ▶ 2017; and
- ▶ 2018.

As of 2002 the area is dominated by sub-urban housing with a small number of available grassed areas. Between 2002 and 2008 there has been an increase in sub-urban development with the majority of the available land has been taken up by housing or factories. However there are some area that appear to have been allocated to park lands. This trend continued to 2015 where development appears to stagnate between 2015 and 2018.



Figure 2-1 KJE Marker 0+000 land use for 2002





Figure 2-2 KJE Marker 0+000 land use for 2008



Figure 2-3 KJE Marker 0+000 land use for 2015





Figure 2-4 KJE Marker 0+000 land use for 2017

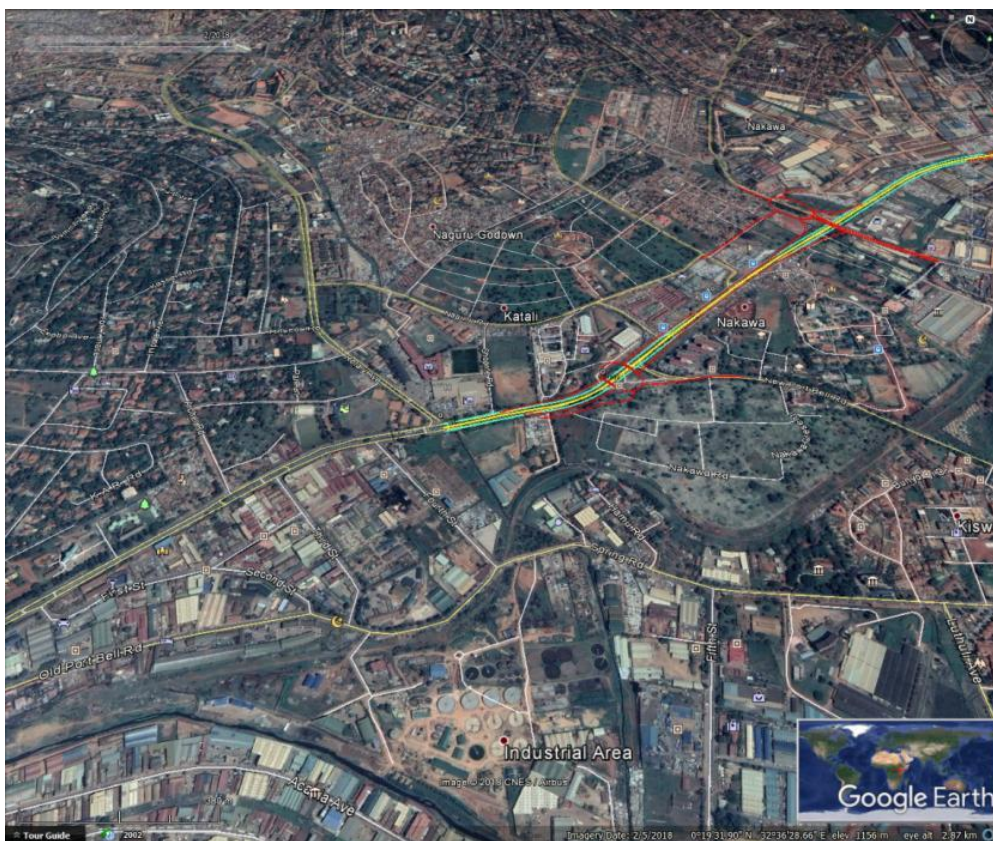


Figure 2-5 KJE Marker 0+000 land use for 2018



## 2.2 Marker 2+000

The major towns surrounding this location are Nakawa, Katalima and Kinawataka. The time periods recorded for Marker 2+000 are represented in figures 2-6 to 2-10 and were recorded in the following years:

- ▶ 2002;
- ▶ 2008;
- ▶ 2015;
- ▶ 2017; and
- ▶ 2018.

As of 2002 the area is dominated by sub-urban housing with a small number of available grassed areas. Between 2002 and 2008 there has been an increase in sub-urban development with the majority of the available land has been taken up by housing or factories. However there are some area that appear to have been allocated to park lands. This trend continued to 2015 where development appears to stagnate between 2015 and 2018.



Figure 2-6 KJE Marker 2+000 land use for 2002





**Figure 2-7 KJE Marker 2+000 land use for 2008**



**Figure 2-8 KJE Marker 2+000 land use for 2015**





Figure 2-9 KJE Marker 2+000 land use for 2017

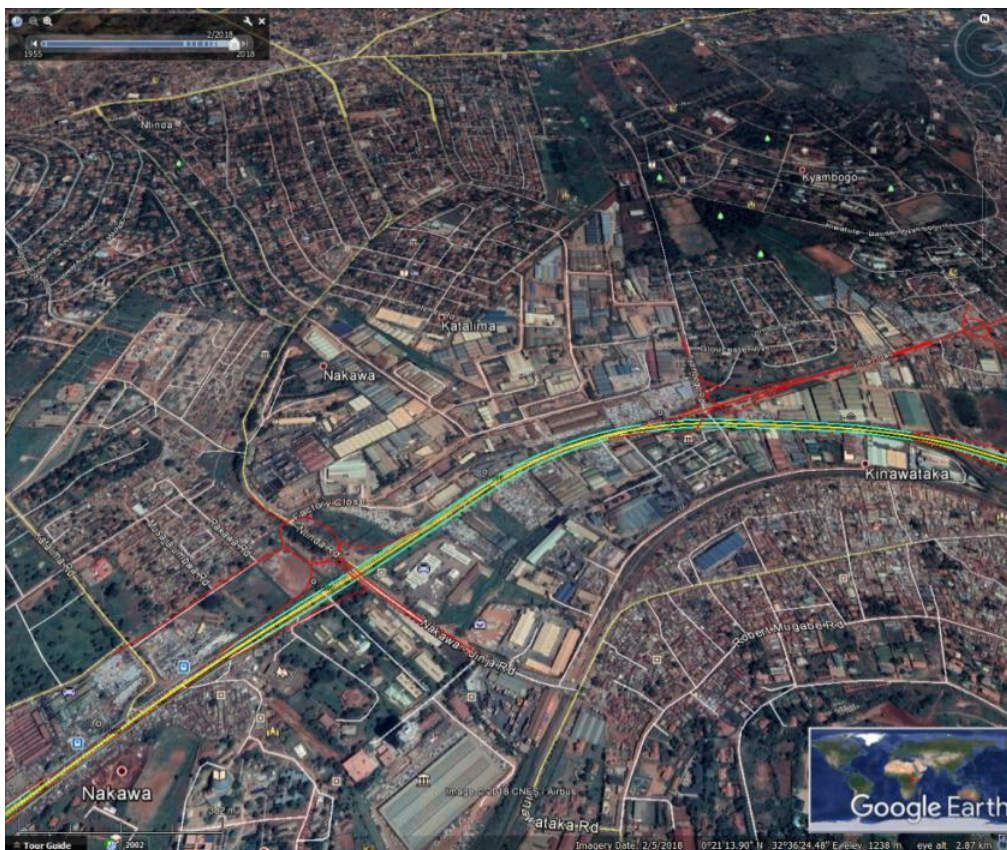


Figure 2-10 KJE Marker 2+000 land use for 2018



## 2.3 Marker 4+000 (Kinawataka)

The major towns surrounding this location are Kinawataka and the Kinawatake Slum. The time periods recorded for Marker 4+000 are represented in figures 2-11 to 2-15 and were recorded in the following years:

- ▶ 2002;
- ▶ 2008;
- ▶ 2013;
- ▶ 2016; and
- ▶ 2018.

As of 2002 the area is dominated by swamplands, particularly below the Kinawataka Slum with and a large amount of open grassed areas. There is also a moderate amount of housing and possibly a number of small urban agricultural areas. Between 2002 and 2008 there has been an increase in sub-urban development with the majority of the available land has been taken up by housing or factories, however at this time the majority of the swampland is still untouched. This trend continued through 2013 to 2018 where the majority of the available space has been taken up by housing and some factories in the North West.

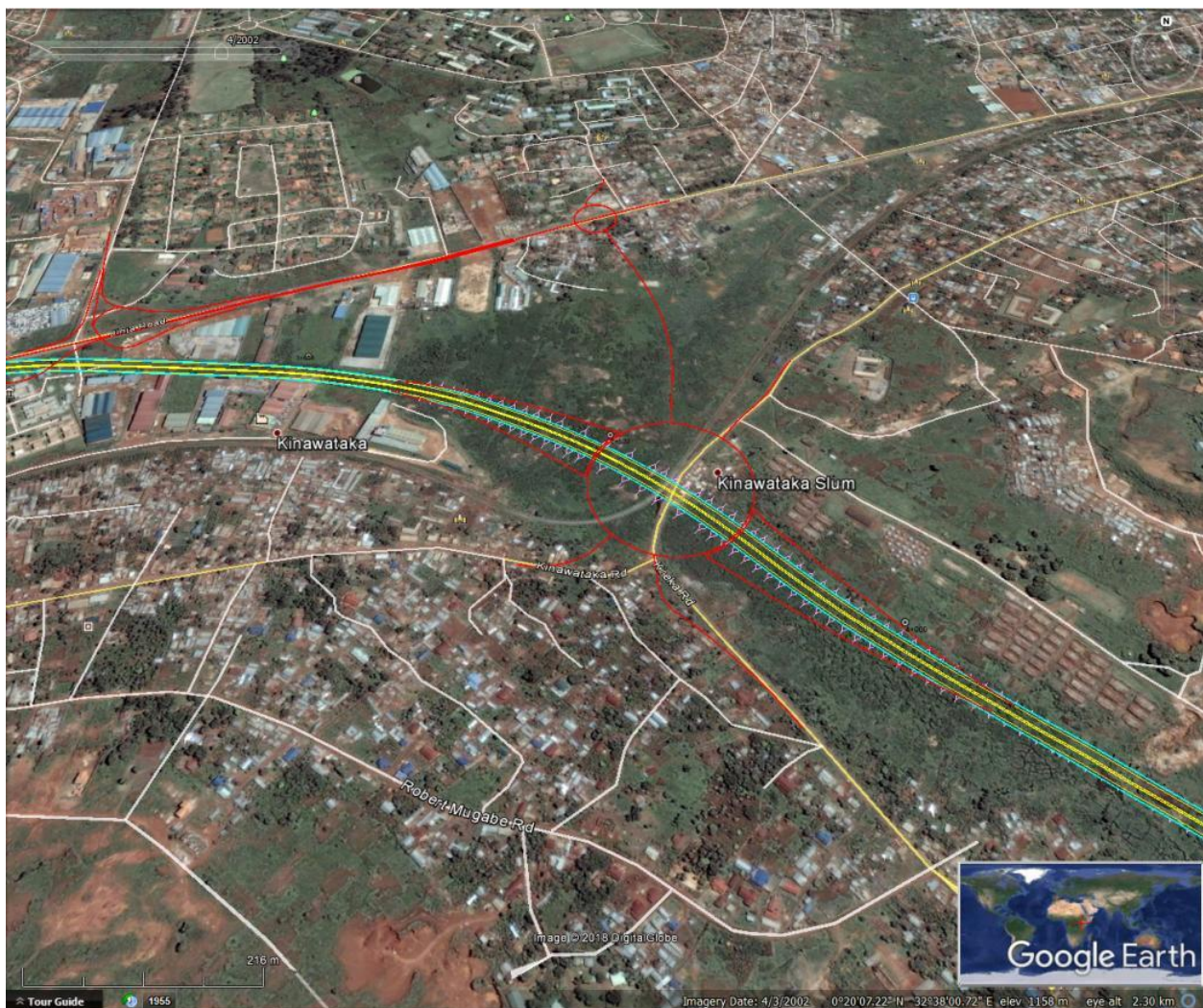


Figure 2-11 KJE Marker 4+000 (Kinawataka) land use for 2002





Figure 2-12 KJE Marker 4+000 (Kinawataka) land use for 2008



Figure 2-13 KJE Marker 4+000 (Kinawataka) land use for 2013





Figure 2-14 KJE Marker 4+000 (Kinawataka) land use for 2016



Figure 2-15 KJE Marker 4+000 (Kinawataka) land use for 2018



## 2.4 Marker 6+000 (Kasokoso)

The major towns surrounding this location are Kasokoso and the Kireka. The time periods recorded for Marker 6+000 are represented in figures 2-16 to 2-21 and were recorded in the following years:

- ▶ 2002;
- ▶ 2004;
- ▶ 2010;
- ▶ 2014;
- ▶ 2017; and
- ▶ 2018.

As of 2002 the area is dominated by uncultivated or agricultural lands with a small number of houses found within the South and North West of the region. Between 2002 and 2004 the majority of the uncultivated or agricultural lands have been repurposed and is dominated by housing. This trend of extreme urban expansion continued from 2004 through to 2014. After 2014 the rate of expansion declines due lack of available land, however between 2014 and 2017 a number of roads have been developed in the Southern region.

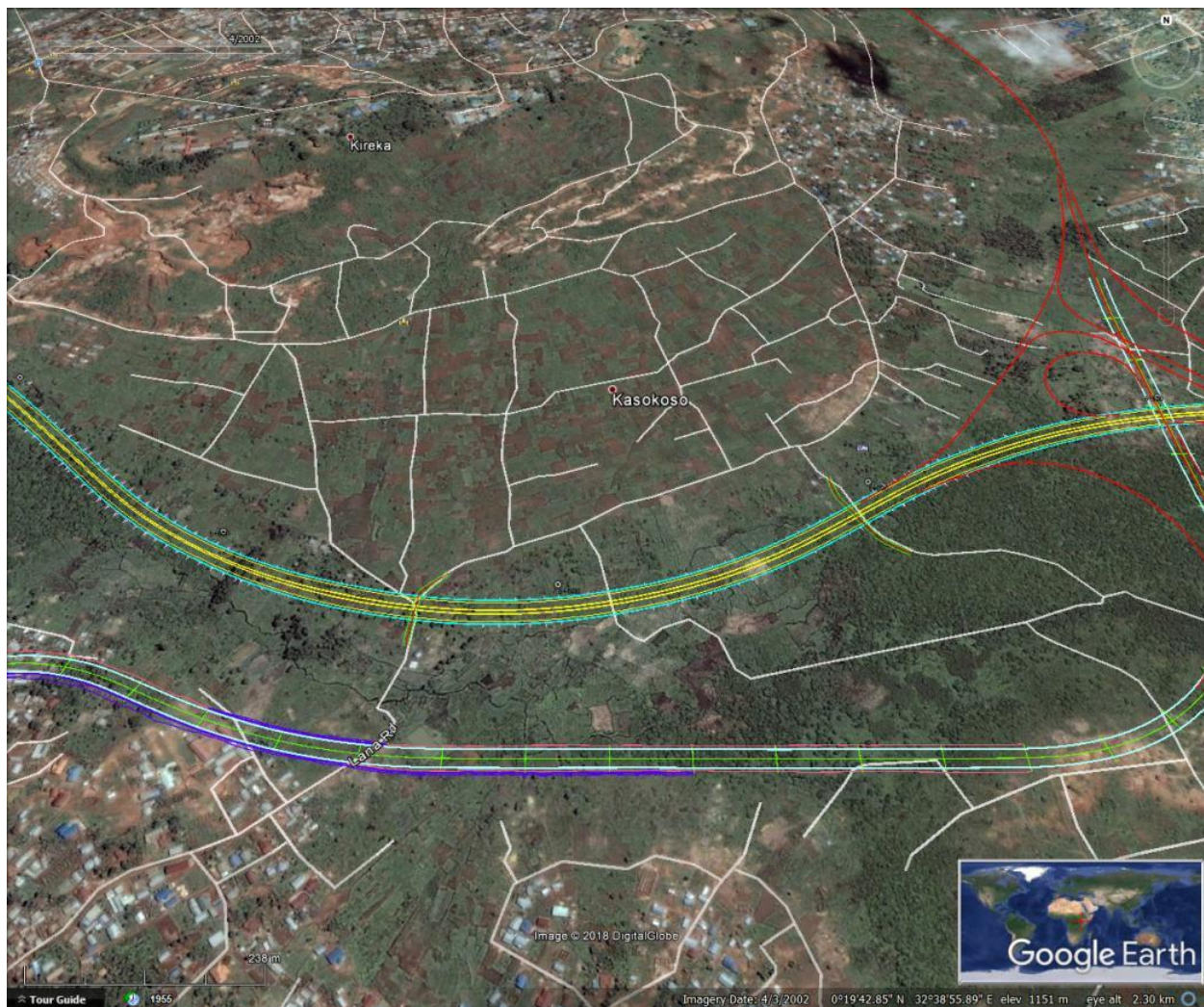
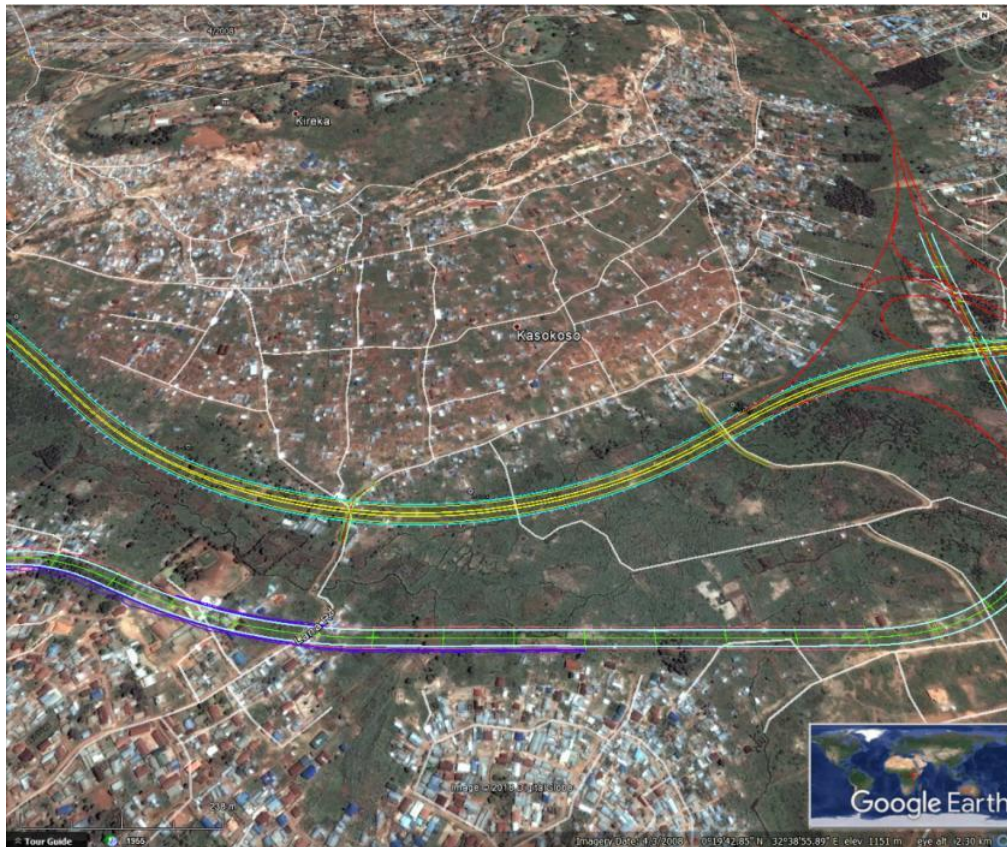
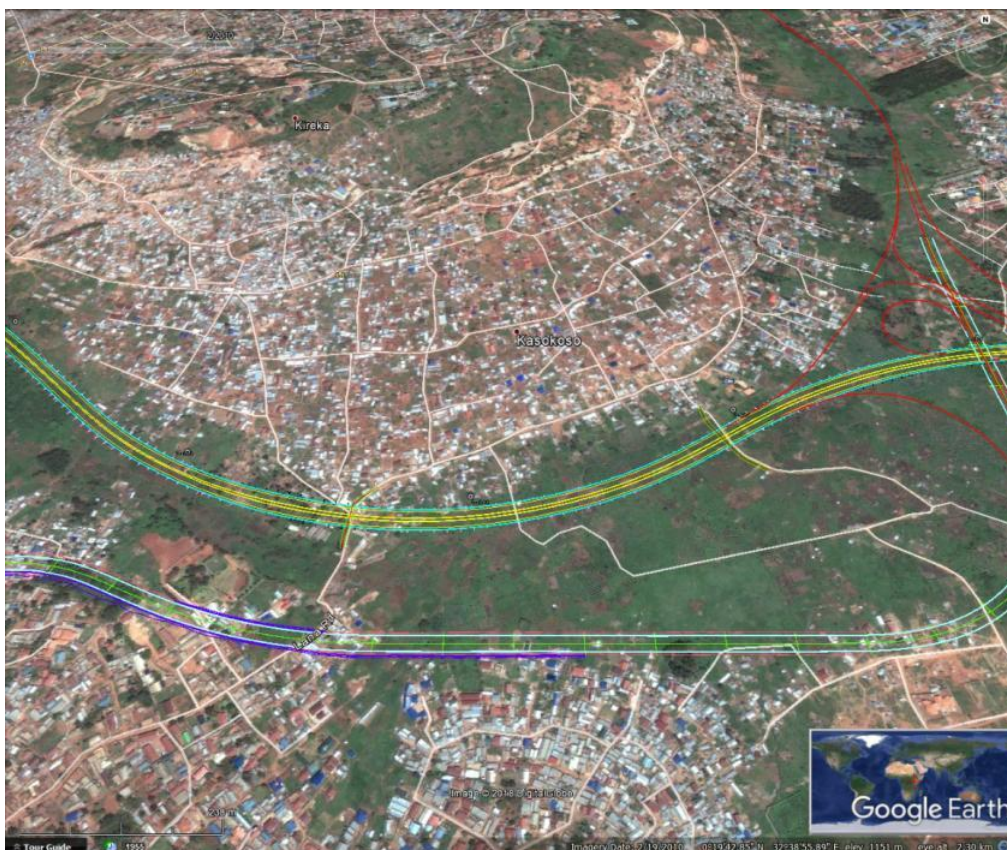


Figure 2-16 KJE Marker 6+000 (Kasokoso) land use for 2002





**Figure 2-17 KJE Marker 6+000 (Kasokoso) land use for 2004**



**Figure 2-18 KJE Marker 6+000 (Kasokoso) land use for 2010**



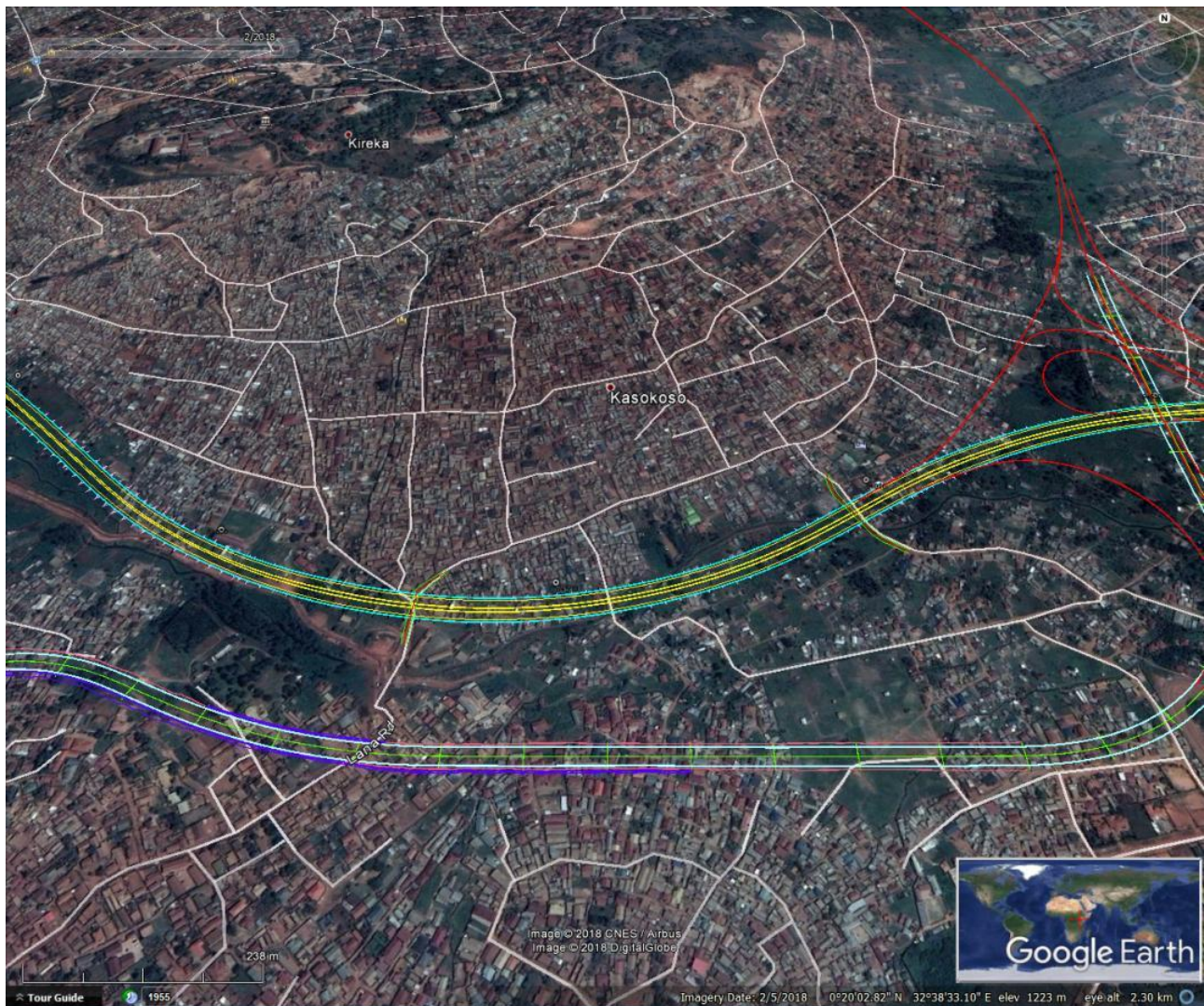


**Figure 2-19 KJE Marker 6+000 (Kasokoso) land use for 2014**



**Figure 2-20 KJE Marker 6+000 (Kasokoso) land use for 2017**





**Figure 2-21 KJE Marker 6+000 (Kasokoso) land use for 2018**



## 2.5 Marker 8+000

The major town surrounding this location is Krinya. The time periods recorded for Marker 8+000 are represented in figures 2-22 to 2-25 and were recorded in the following years:

- ▶ 2004;
- ▶ 2010;
- ▶ 2014; and
- ▶ 2018.

As of 2004 the area is dominated by uncultivated or agricultural lands with almost no housing found within the region. From 2004 to 2018 there has been a continuous urban development within the Northern region of this area, the most significant expansion noted between 2004 and 2010 and 2010 and 2014. The southern region of this area remains dominated by what appears to be open grassland and forests.

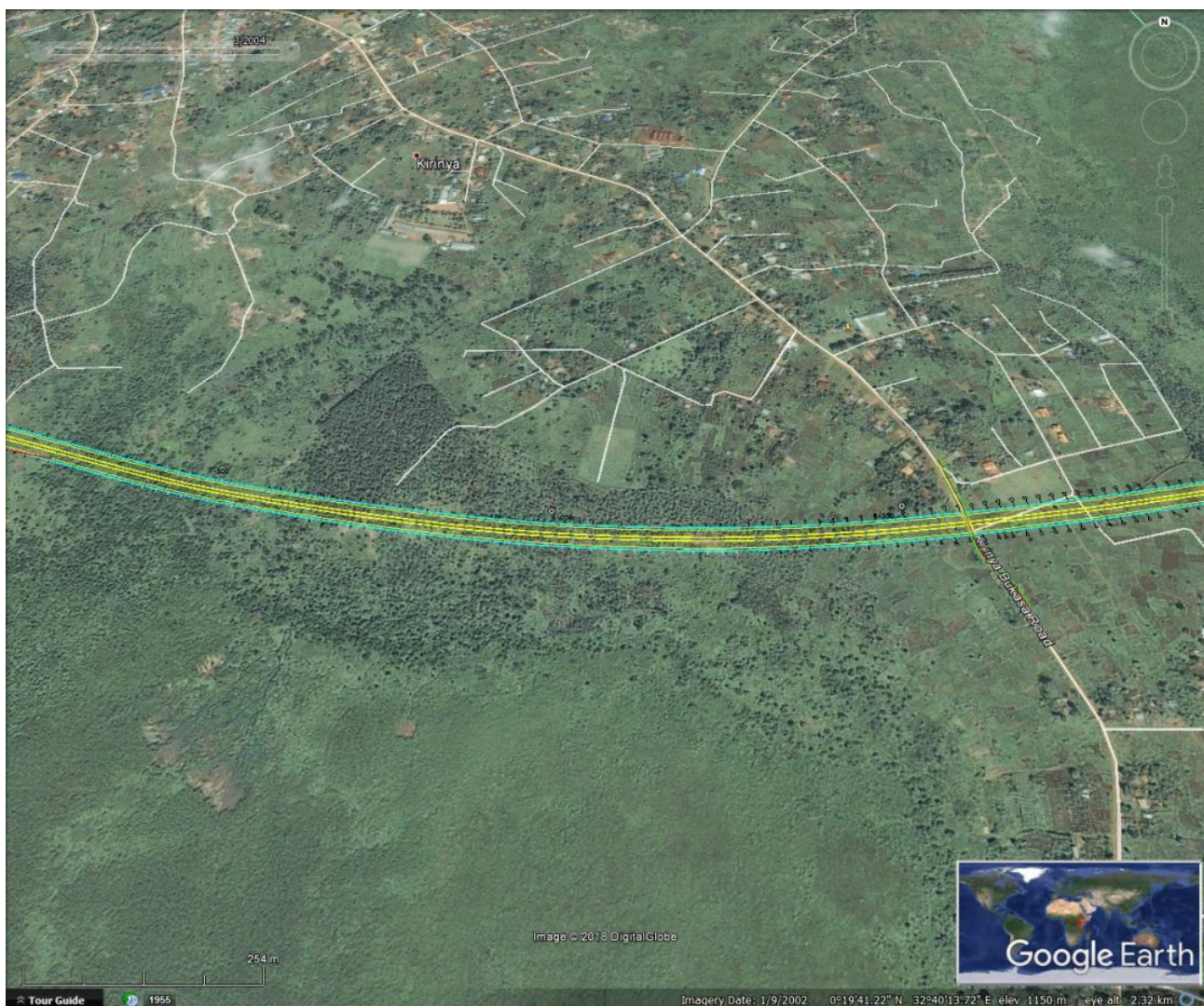
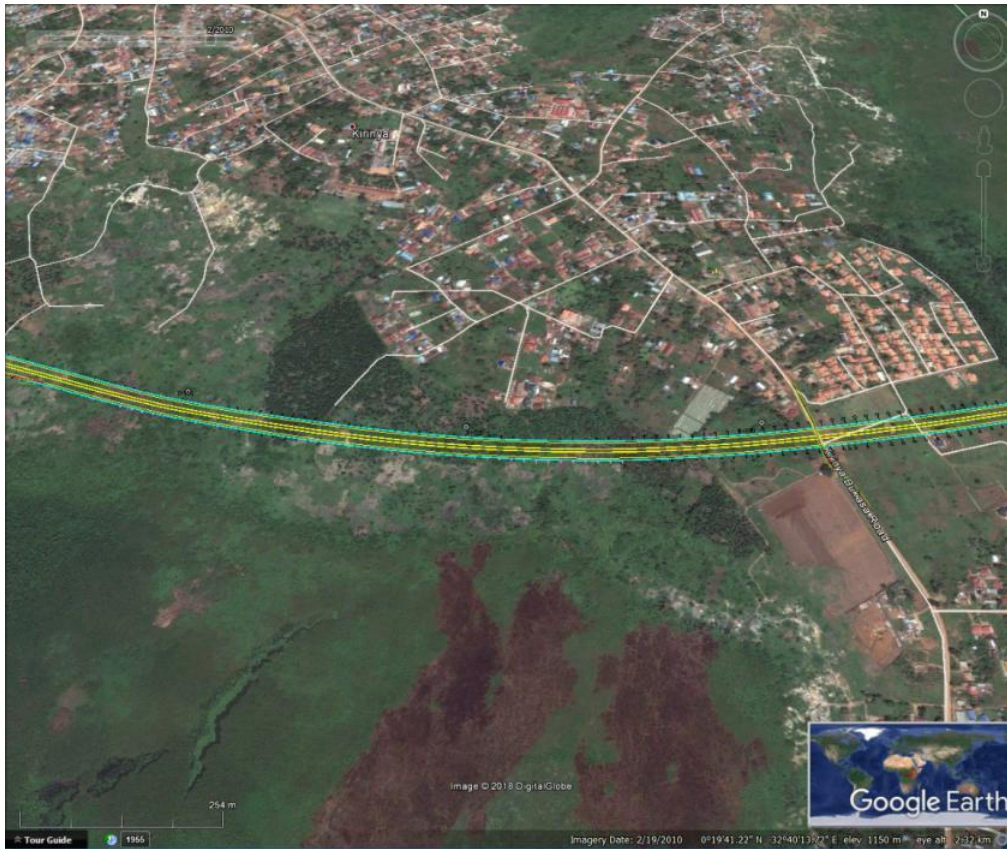


Figure 2-22 KJE Marker 8+000 land use for 2004



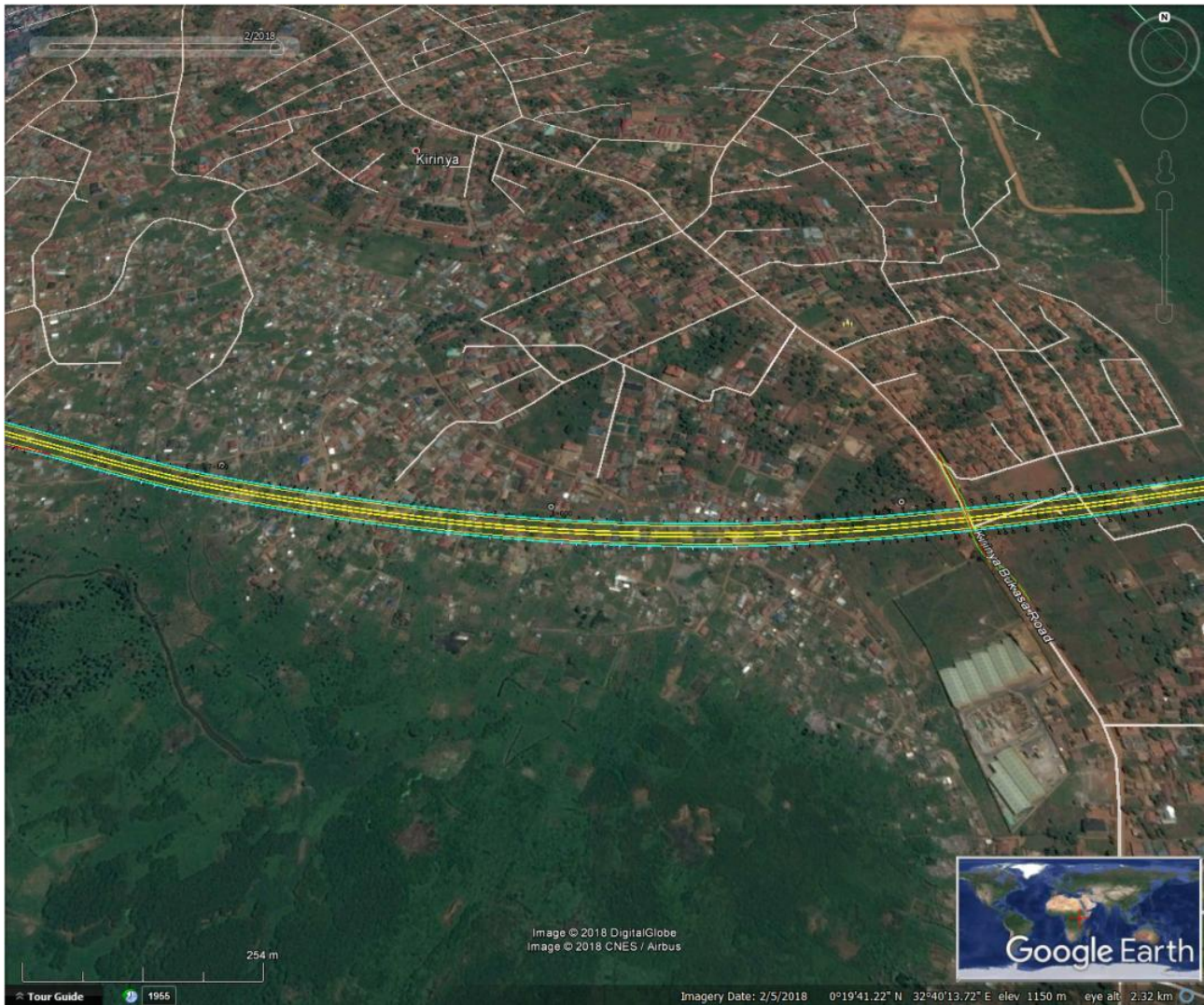


**Figure 2-23 KJE Marker 8+000 land use for 2010**



**Figure 2-24 KJE Marker 8+000 land use for 2014**





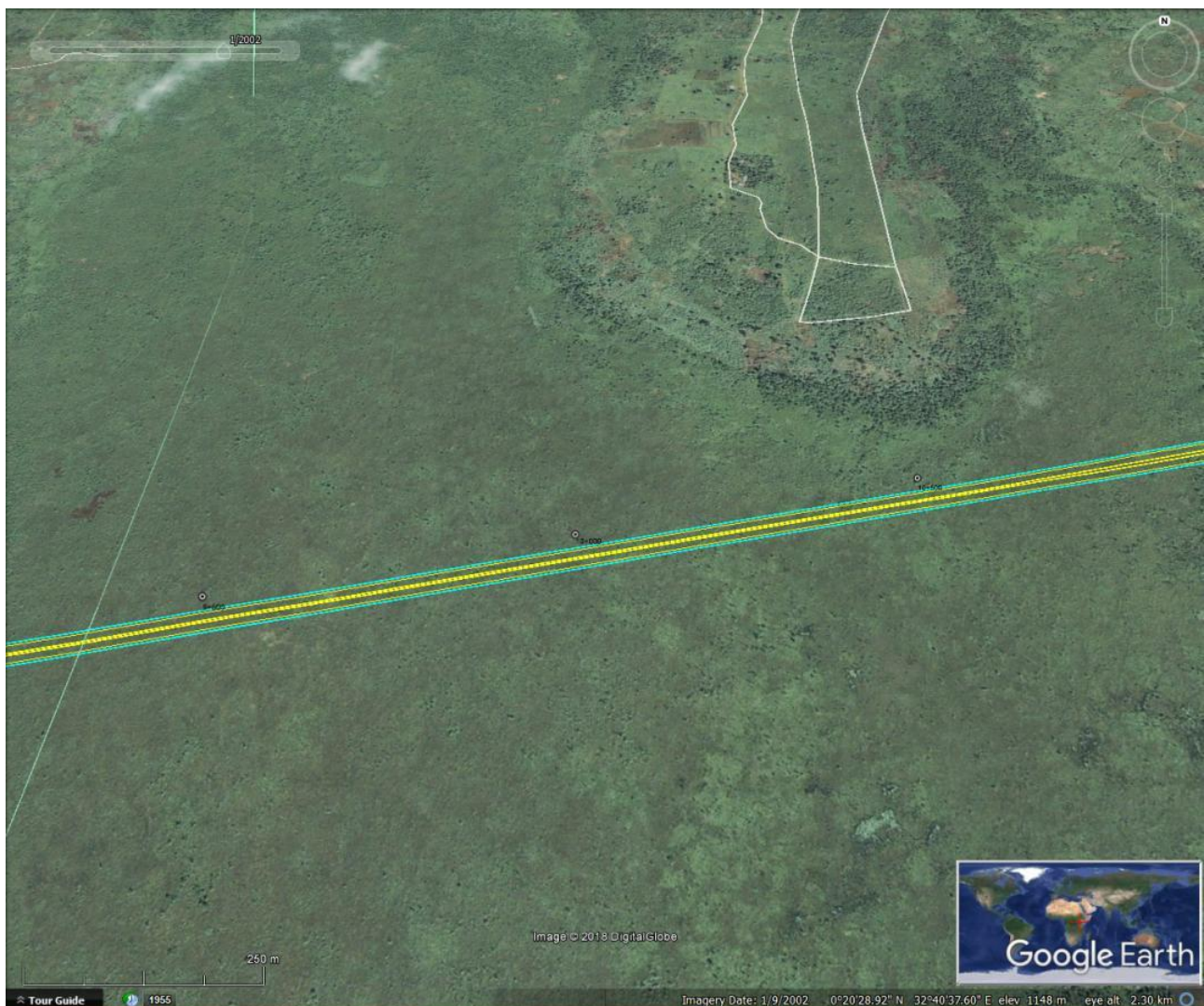
**Figure 2-25 KJE Marker 8+000 land use for 2018**

## 2.6 Marker 10+000

The time periods recorded for Marker 10+000 are represented in figures 2-26 to 2-29 and were recorded in the following years:

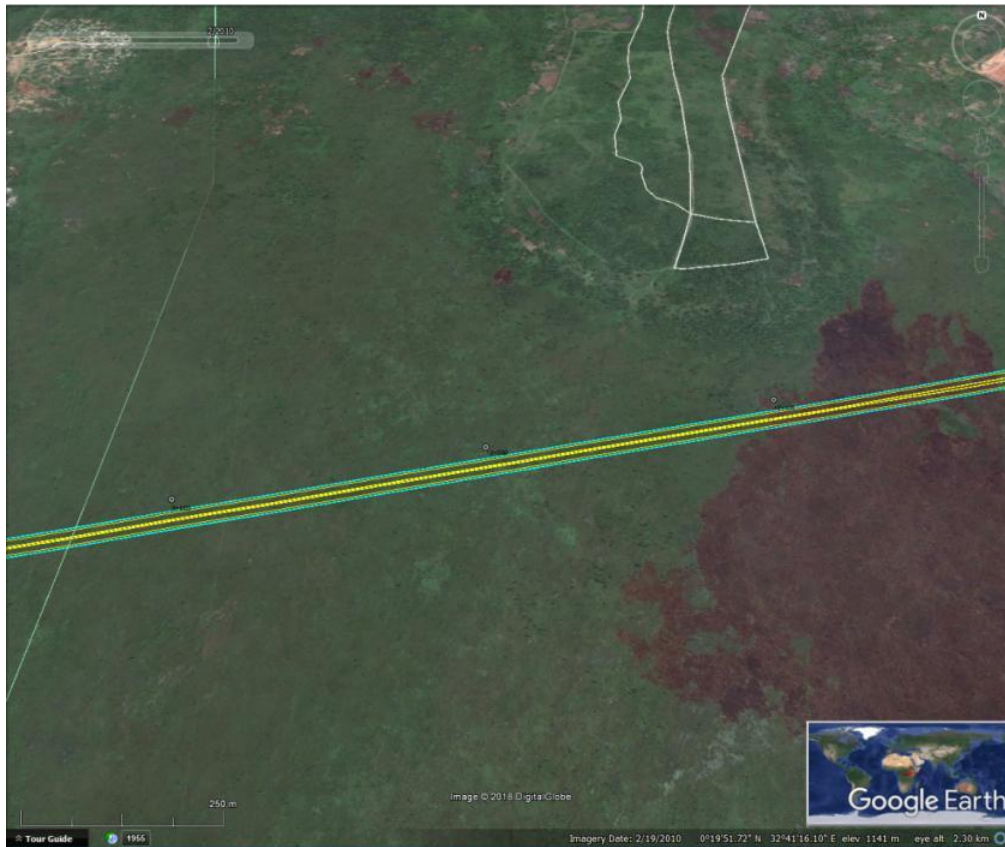
- ▶ 2002;
- ▶ 2010;
- ▶ 2016; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period. However there appears to be clearing in the Northern region of the area for agricultural purposes between 2010 and 2016.

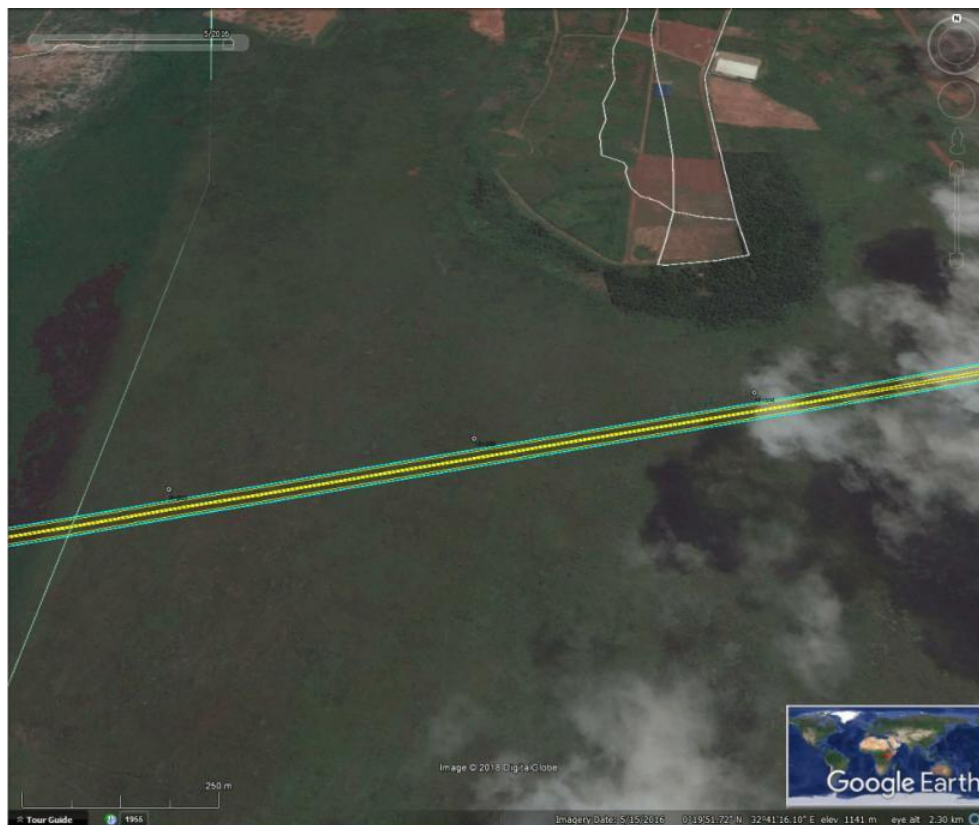


**Figure 2-26 KJE Marker 10+000 land use for 2002**





**Figure 2-27 KJE Marker 10+000 land use for 2010**



**Figure 2-28 KJE Marker 10+000 land use for 2016**



Figure 2-29 KJE Marker 10+000 land use for 2018



## 2.7 Marker 12+000

The time periods recorded for Marker 12+000 are represented in figures 2-30 to 2-32 and were recorded in the following years:

- ▶ 2002;
- ▶ 2017; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period. However there appears to be clearing in the Northern and Central region of the area for urban between 2017 and 2018.



**Figure 2-30 KJE Marker 12+000 land use for 2002**





**Figure 2-31 KJE Marker 12+000 land use for 2018**



**Figure 2-32 KJE Marker 12+000 land use for 2018**



## 2.8 Marker 14+000

The time periods recorded for Marker 14+000 are represented in figures 2-33 to 2-35 and were recorded in the following years:

- ▶ 2010;
- ▶ 2015; and
- ▶ 2017.

There is a significant change in land use within the region over the surveyed time period. There appears to be significant clearing in throughout the region for agricultural purposes between 2015 and 2017.

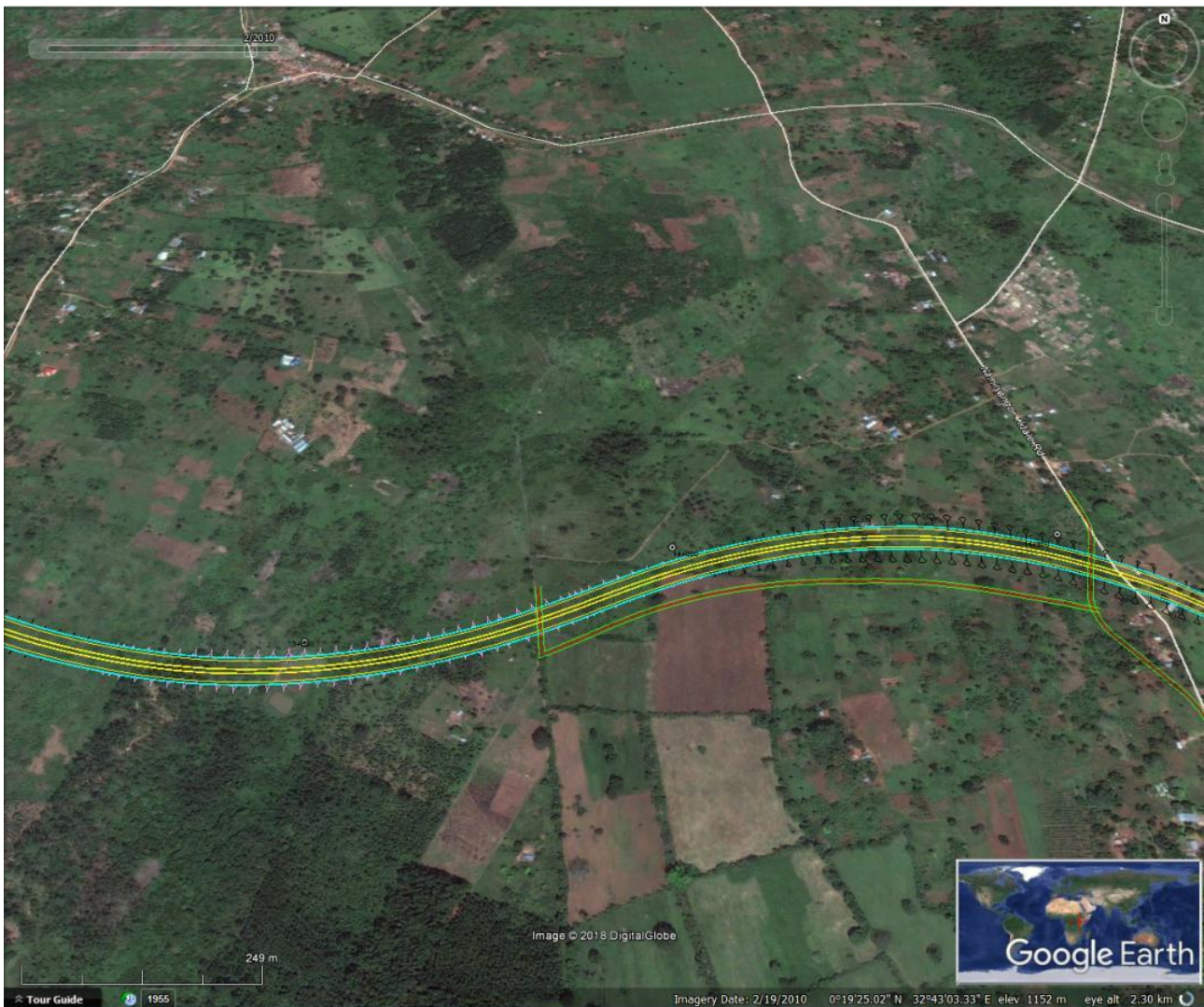


Figure 2-33 KJE Marker 14+000 land use for 2010



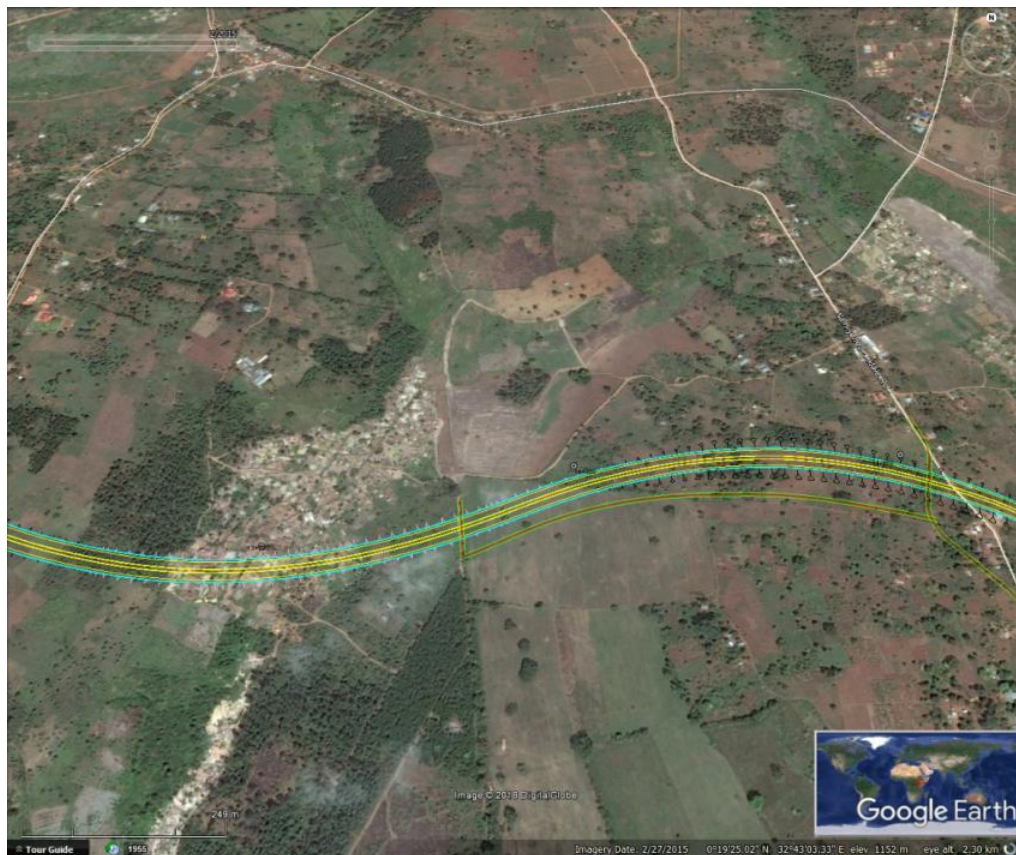


Figure 2-34 KJE Marker 1+000 land use for 2015



Figure 2-35 KJE Marker 14+000 land use for 2017

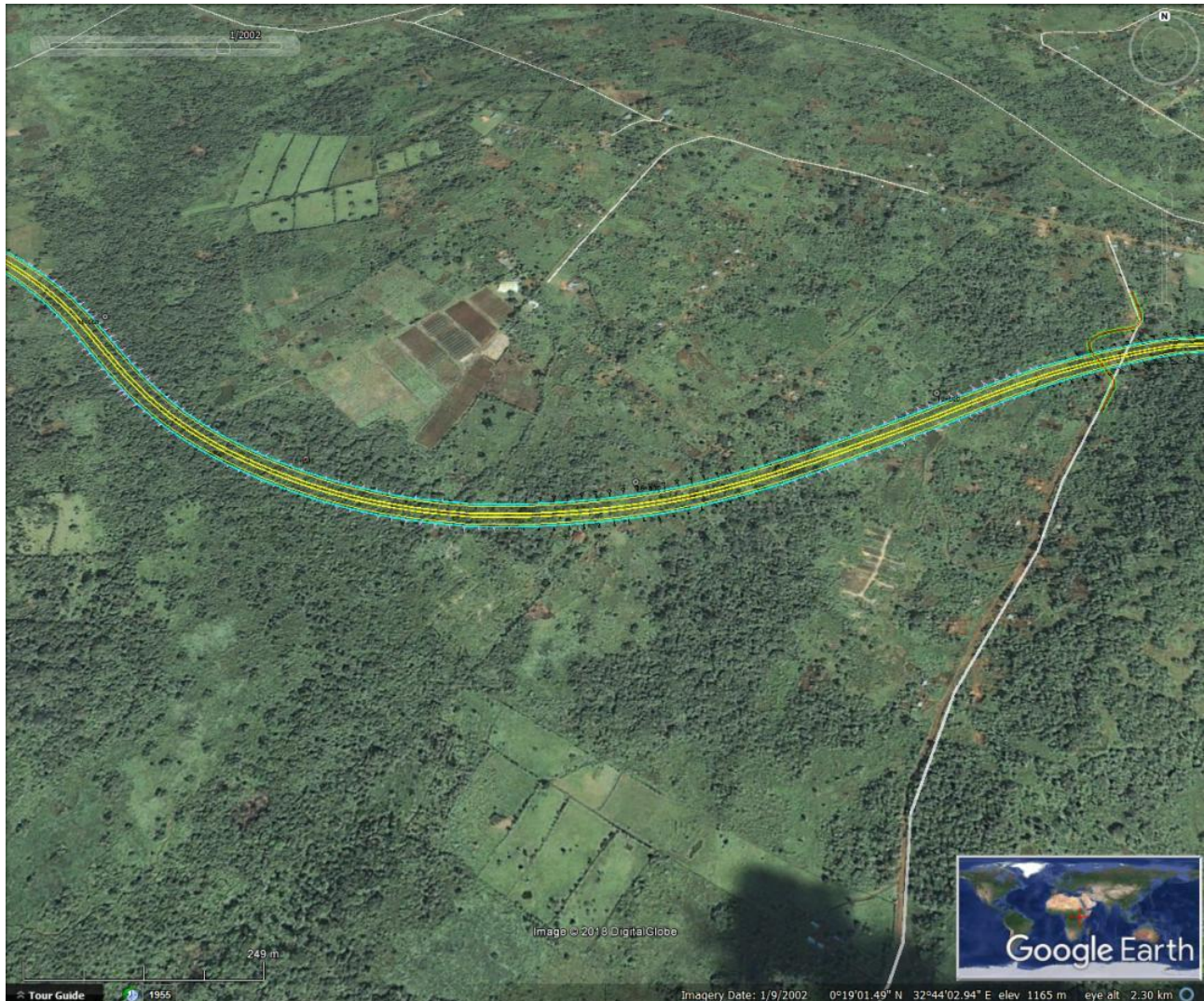


## 2.9 Marker 16+000

The time periods recorded for Marker 16+000 are represented in figures 2-36 to 2-37 and were recorded in the following years:

- ▶ 2002; and
- ▶ 2017.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-36 KJE Marker 16+000 land use for 2002**





**Figure 2-37 KJE Marker 16+000 land use for 2017**



## 2.10 Marker 18+000

The time periods recorded for Marker 18+000 are represented in figures 2-38 to 2-39 and were recorded in the following years:

- ▶ 2006; and
- ▶ 2015.

There is has been some change from open grassland and forests to agricultural lands within this region, particularly below the project mainline. There has also been a small increase in housing to the North of the project mainline.

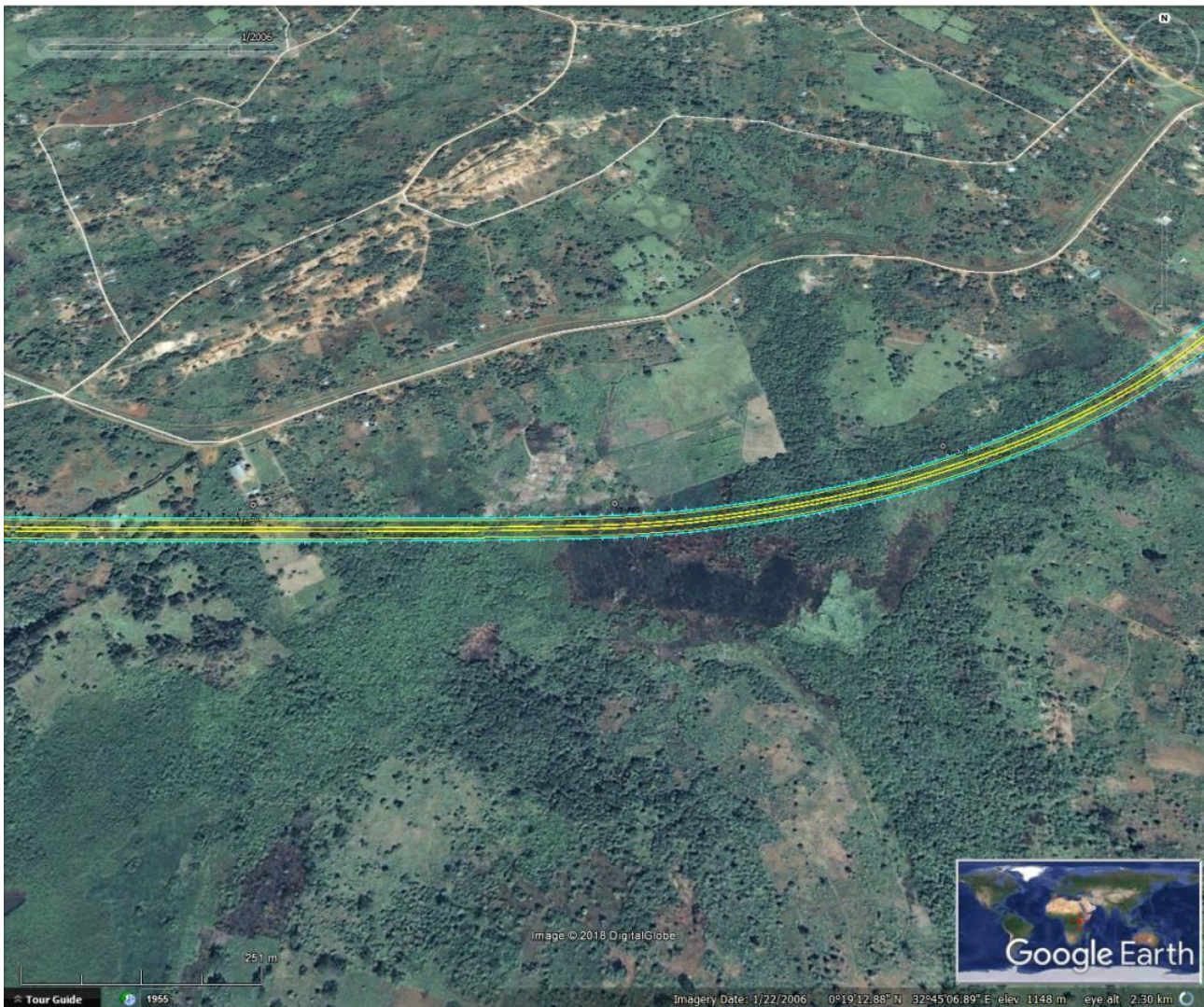


Figure 2-38 KJE Marker 18+000 land use for 2006





**Figure 2-39 KJE Marker 18+000 land use for 2015**



## 2.11 Marker 20+000

The time periods recorded for Marker 20+000 are represented in figures 2-40 to 2-42 and were recorded in the following years:

- ▶ 2006;
- ▶ 2015; and
- ▶ 2017.

This region of the project mainline is dominated by open grassland and agricultural lands. Within this region of the project there has been a significant increase in housing, seemingly not affecting the agricultural lands and reducing the total grassland areas.

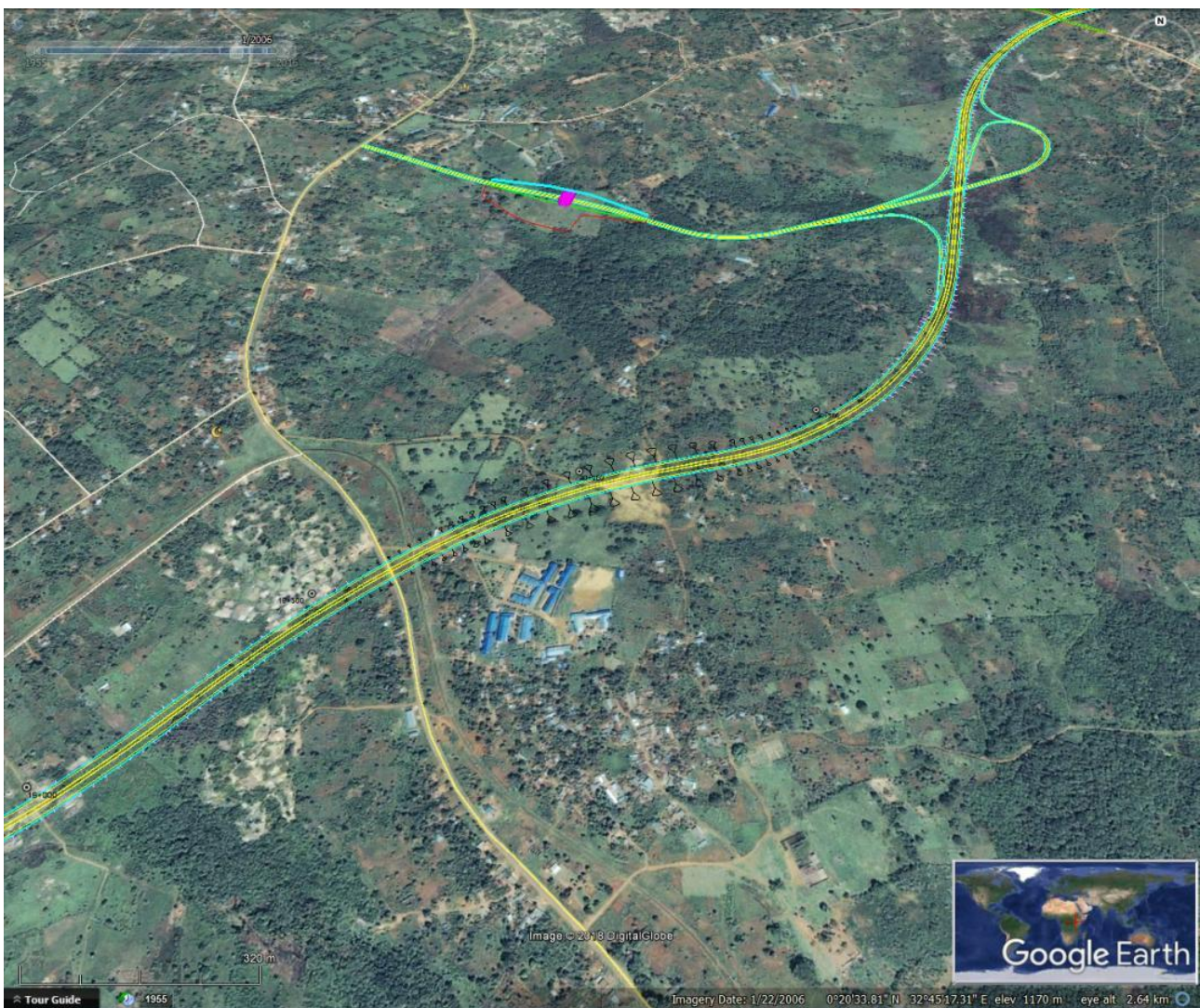


Figure 2-40 KJE Marker 20+000 land use for 2006





Figure 2-41 KJE Marker 20+000 land use for 2015

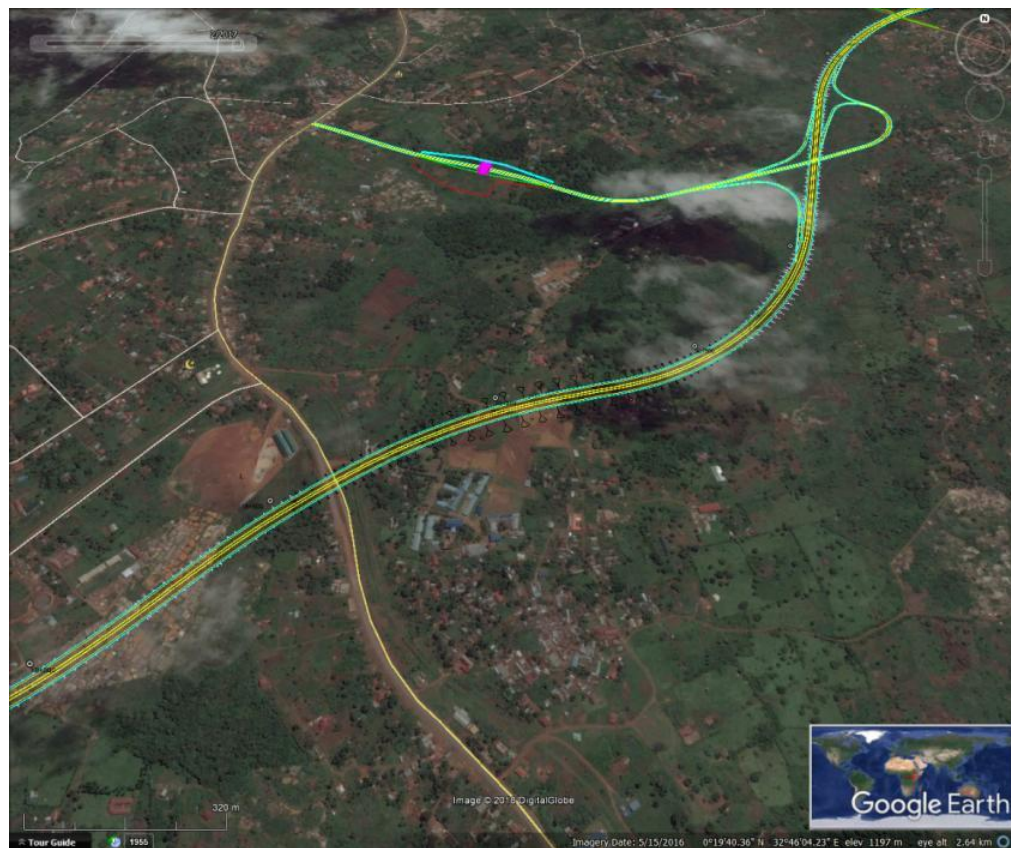


Figure 2-42 KJE Marker 20+000 land use for 2017



## 2.12 Marker 22+000

The time periods recorded for Marker 22+000 are represented in figures 2-43 to 2-44 and were recorded in the following years:

- ▶ 2006; and
- ▶ 2016.

There is no significant change in land use within the region over the surveyed time period. However there has been a small increase in housing.



Figure 2-43 KJE Marker 22+000 land use for 2006





**Figure 2-44 KJE Marker 22+000 land use for 2016**

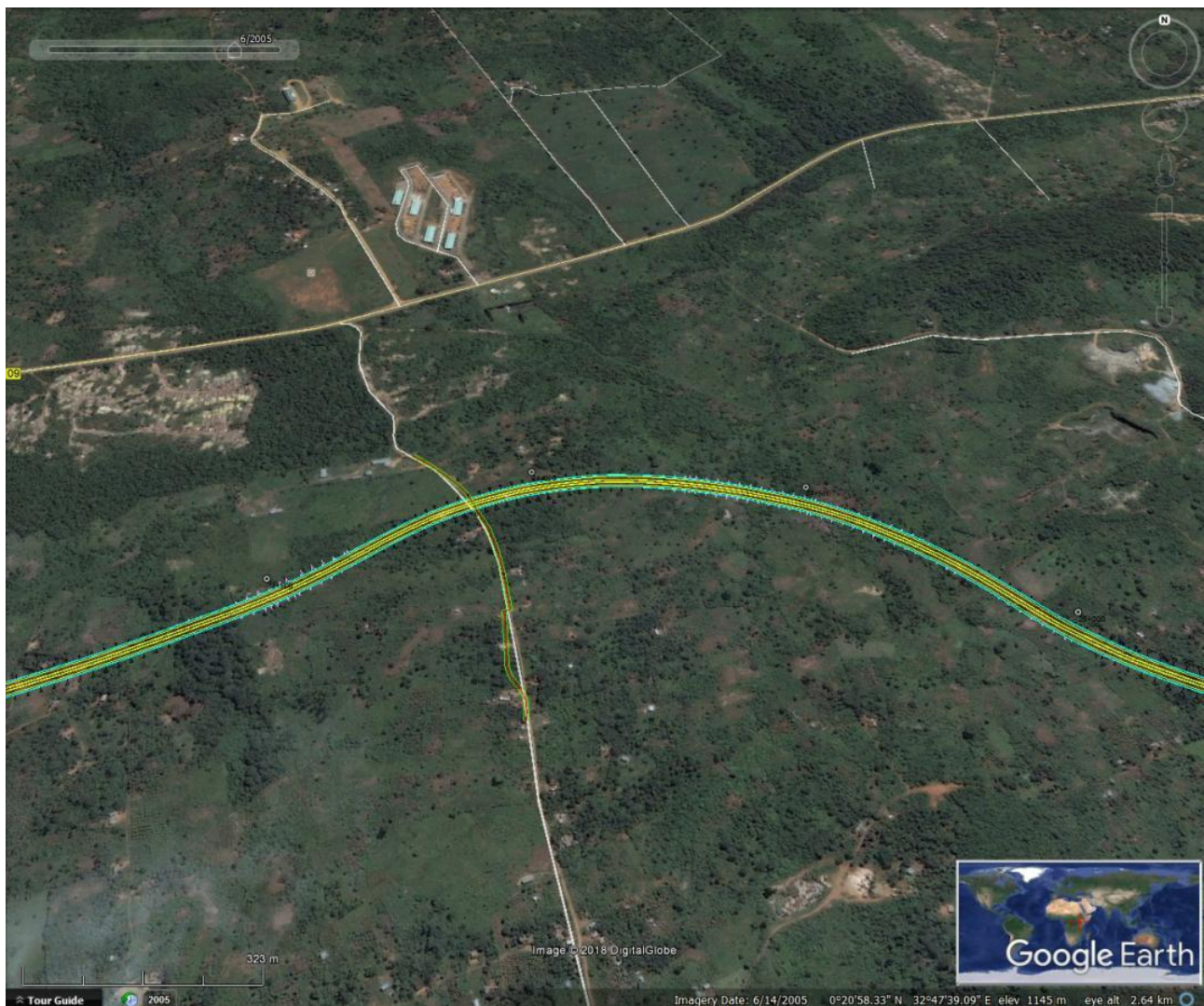


## 2.13 Marker 24+000

The time periods recorded for Marker 24+000 are represented in figures 2-45 to 2-47 and were recorded in the following years:

- ▶ 2005;
- ▶ 2010; and
- ▶ 2014.

There is a significant change in land use within the region over the surveyed time period. There appears to be significant clearing in throughout the region for agricultural purposes between 2015 and 2017.

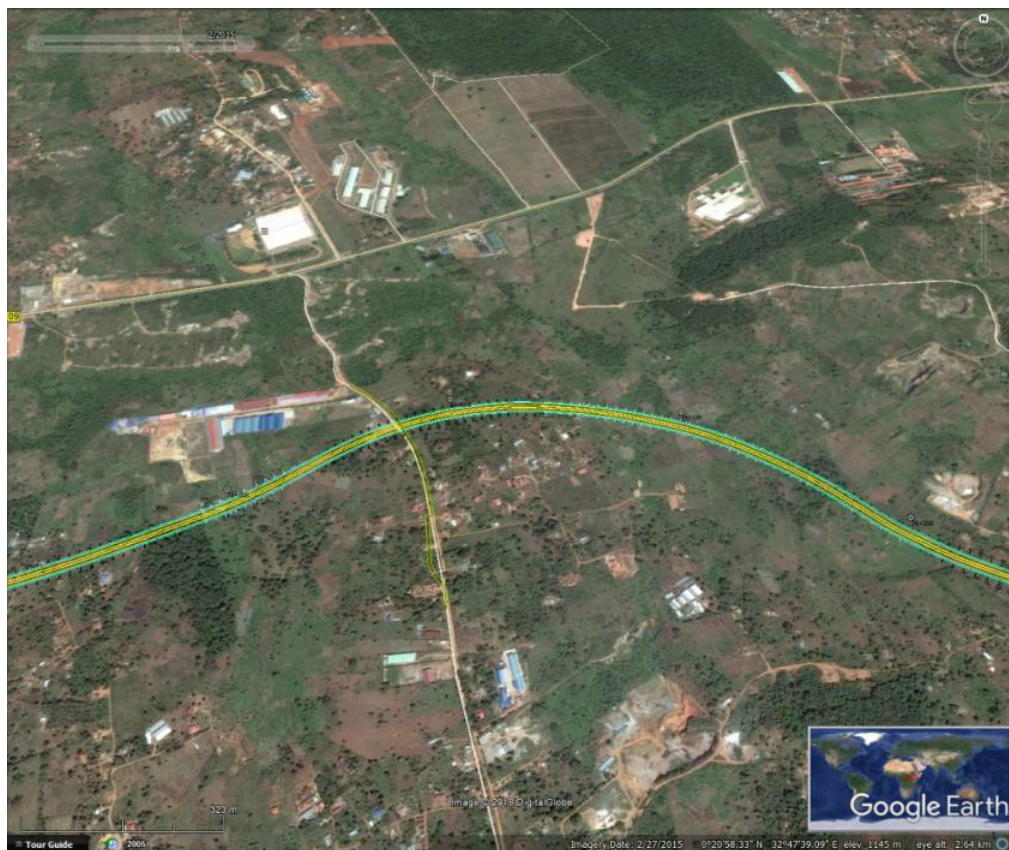


**Figure 2-45 KJE Marker 24+000 land use for 2005**





**Figure 2-46 KJE Marker 22+000 land use for 2010**



**Figure 2-47 KJE Marker 24+000 land use for 2014**

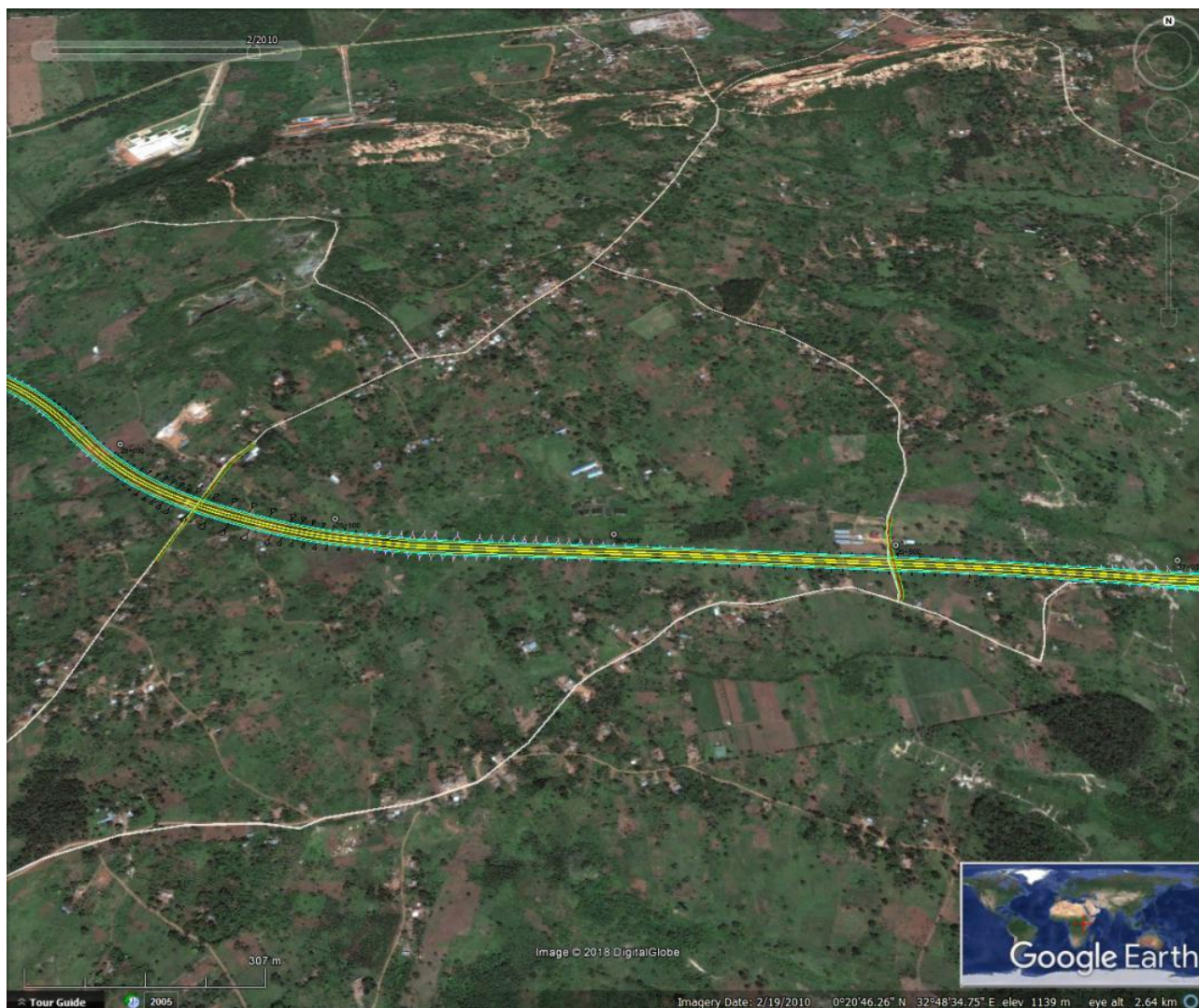


## 2.14 Marker 26+000

The time periods recorded for Marker 26+000 are represented in figures 2-48 to 2-49 and were recorded in the following years:

- ▶ 2010; and
- ▶ 2016.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-48 KJE Marker 26+000 land use for 2010**





**Figure 2-49 KJE Marker 26+000 land use for 2016**



## 2.15 Marker 28+000

The major town surrounding this location is Luwunga. The time periods recorded for Marker 28+000 are represented in figures 2-50 to 2-51 and were recorded in the following years:

- ▶ 2005; and
- ▶ 2017.

There is no significant change in land use within the region over the surveyed time period.

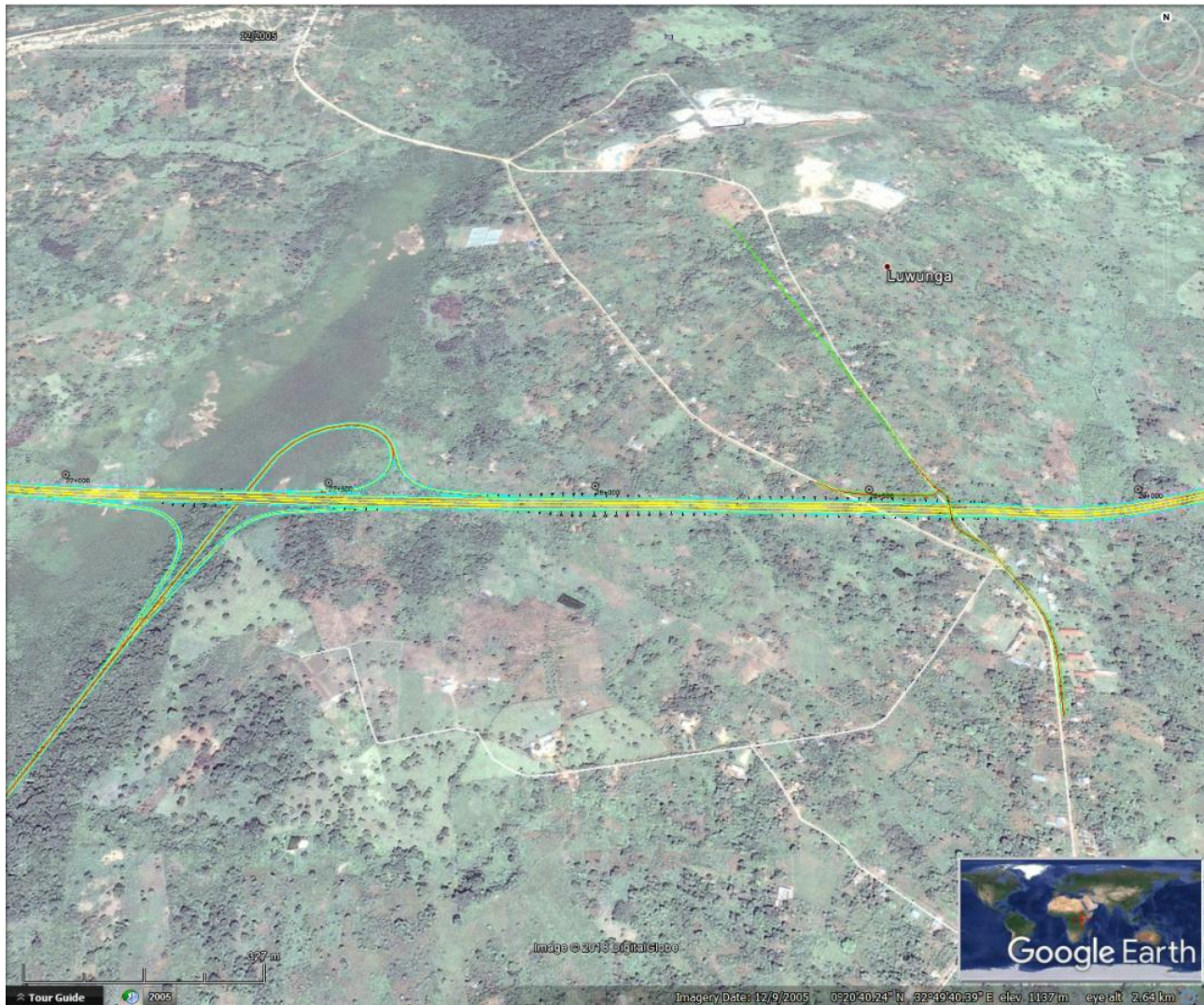


Figure 2-50 KJE Marker 28+000 land use for 2005



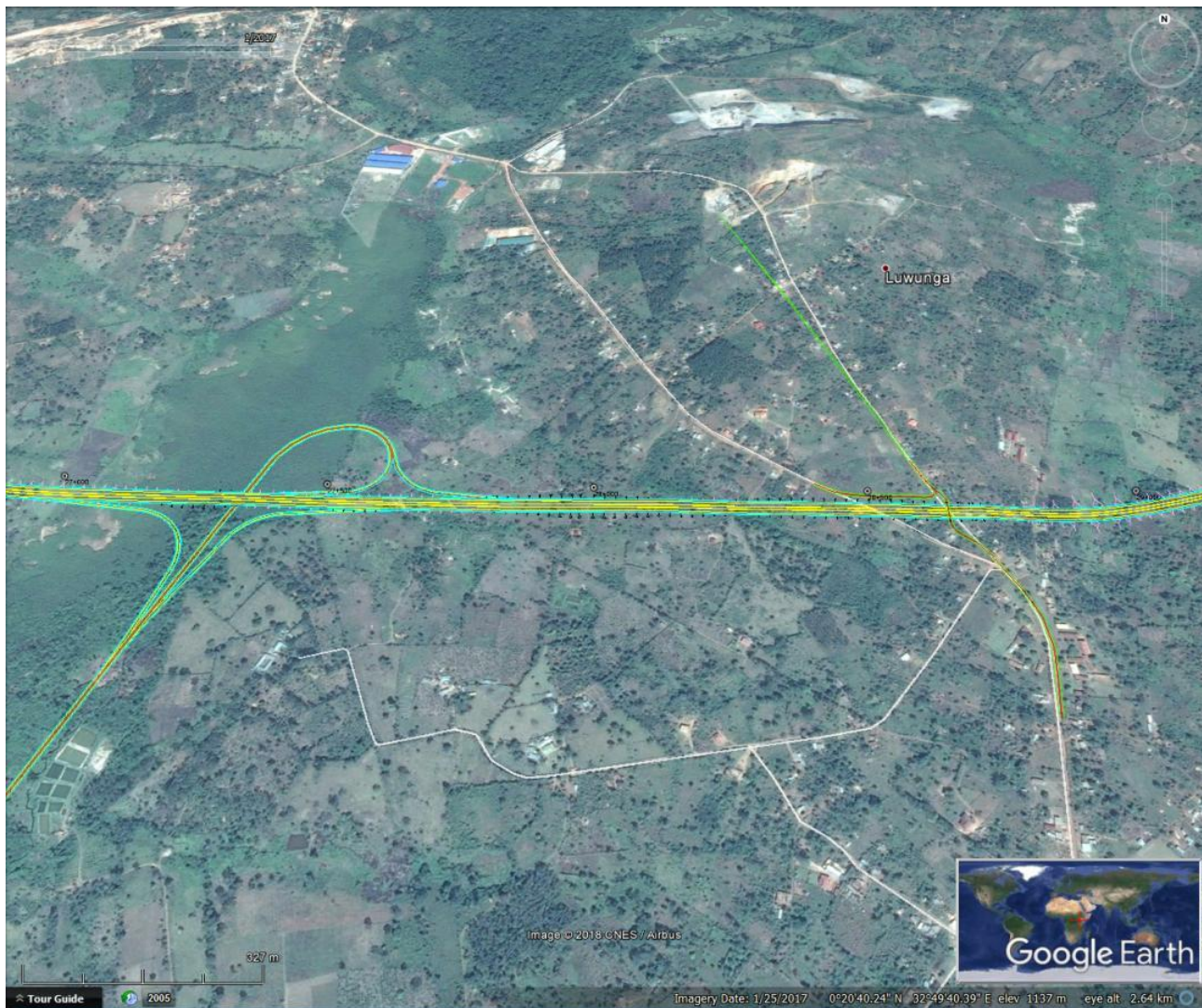


Figure 2-51 KJE Marker 28+000 land use for 2017



## 2.16 Marker 30+000

The time periods recorded for Marker 30+000 are represented in figures 2-52 to 2-53 and were recorded in the following years:

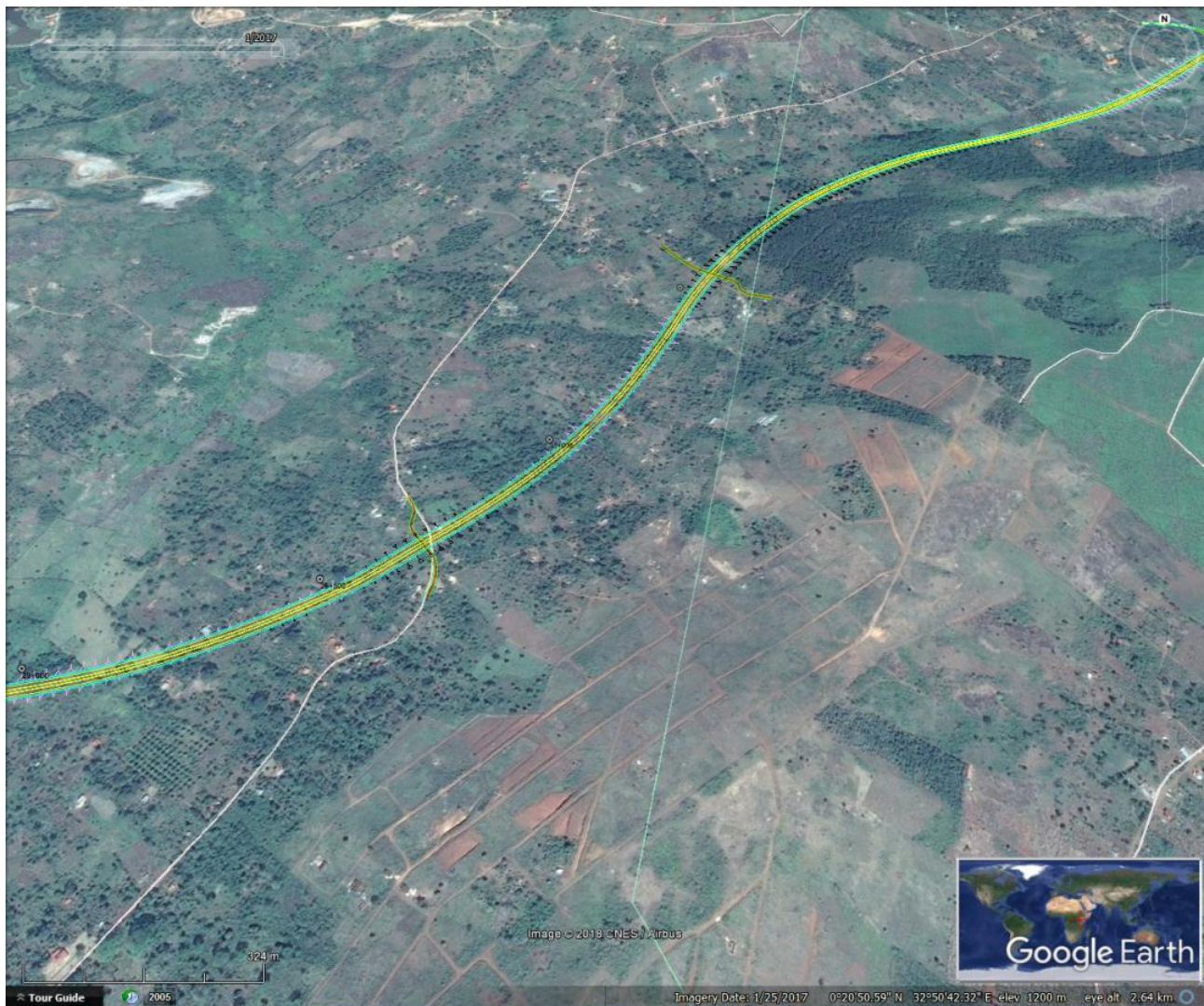
- ▶ 2006; and
- ▶ 2017.

There is no significant change in land use within the region over the surveyed time period. However there is some small agricultural expansion in the South East.



Figure 2-52 KJE Marker 30+000 land use for 2006





**Figure 2-53 KJE Marker 30+000 land use for 2017**



## 2.17 Marker 32+000

The time periods recorded for Marker 32+000 are represented in figures 2-54 to 2-55 and were recorded in the following years:

- ▶ 2010; and
- ▶ 2017.

There is no significant change in land use within the region over the surveyed time period.



Figure 2-54 KJE Marker 32+000 land use for 2010



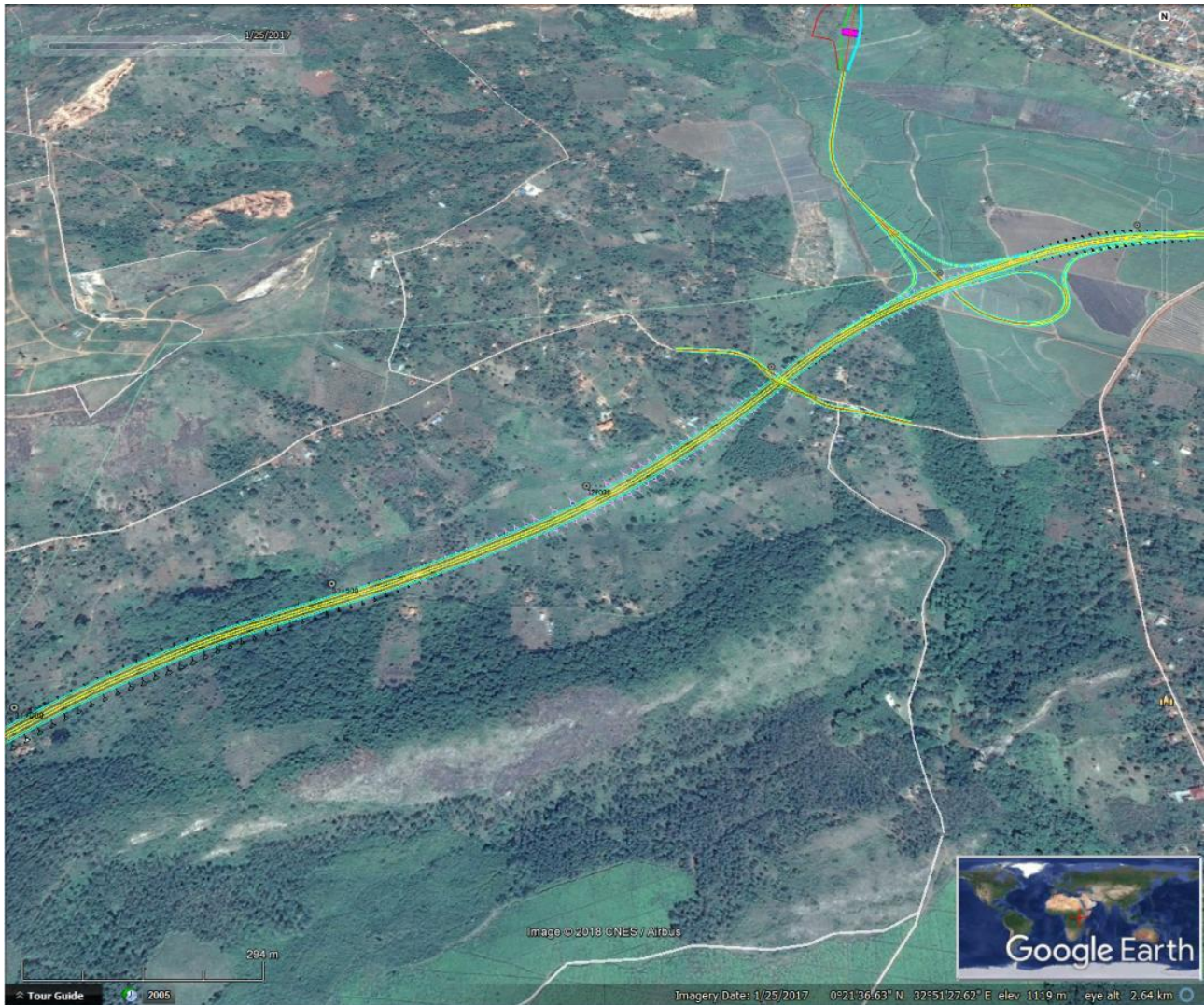


Figure 2-55 KJE Marker 32+000 land use for 2017



## 2.18 Marker 34+000

The time periods recorded for Marker 34+000 are represented in figures 2-56 to 2-57 and were recorded in the following years:

- ▶ 2010; and
- ▶ 2017.

There is no significant change in land use within the region over the surveyed time period. The Northern part of the region is dominated by housing and the Southern part of the region is dominated by agriculture.



Figure 2-56 KJE Marker 34+000 land use for 2010





Figure 2-57 KJE Marker 34+000 land use for 2017



## 2.19 Marker 36+000

The time periods recorded for Marker 36+000 are represented in figures 2-58 to 2-59 and were recorded in the following years:

- ▶ 2005; and
- ▶ 2017.

There is no significant change in land use within the region over the surveyed time period.



Figure 2-58 KJE Marker 36+000 land use for 2005





Figure 2-59 KJE Marker 36+000 land use for 2017



## 2.20 Marker 38+000

The time periods recorded for Marker 38+000 are represented in figures 2-60 to 2-61 and were recorded in the following years:

- ▶ 2010; and
- ▶ 2017.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-60 KJE Marker 38+000 land use for 2010**





**Figure 2-61 KJE Marker 38+000 land use for 2017**



## 2.21 Marker 40+000

The time periods recorded for Marker 40+000 are represented in figures 2-62 to 2-63 and were recorded in the following years:

- ▶ 2010; and
- ▶ 2017.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-62 KJE Marker 40+000 land use for 2010**





Figure 2-63 KJE Marker 40+000 land use for 2017



## 2.22 Marker 42+000

The time periods recorded for Marker 42+000 are represented in figures 2-64 to 2-65 and were recorded in the following years:

- ▶ 2010; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-64 KJE Marker 42+000 land use for 2010**





Figure 2-65 KJE Marker 42+000 land use for 2018



## 2.23 Marker 44+000

The time periods recorded for Marker 44+000 are represented in figures 2-66 to 2-67 and were recorded in the following years:

- ▶ 2010; and
- ▶ 2017.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-66 KJE Marker 44+000 land use for 2010**





**Figure 2-67 KJE Marker 44+000 land use for 2017**



## 2.24 Marker 46+000

The time periods recorded for Marker 46+000 are represented in figures 2-68 to 2-69 and were recorded in the following years:

- ▶ 2010; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-68 KJE Marker 46+000 land use for 2010**





Figure 2-69 KJE Marker 46+000 land use for 2017



## 2.25 Marker 48+000

The time periods recorded for Marker 48+000 are represented in figures 2-70 to 2-71 and were recorded in the following years:

- ▶ 2010; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period.

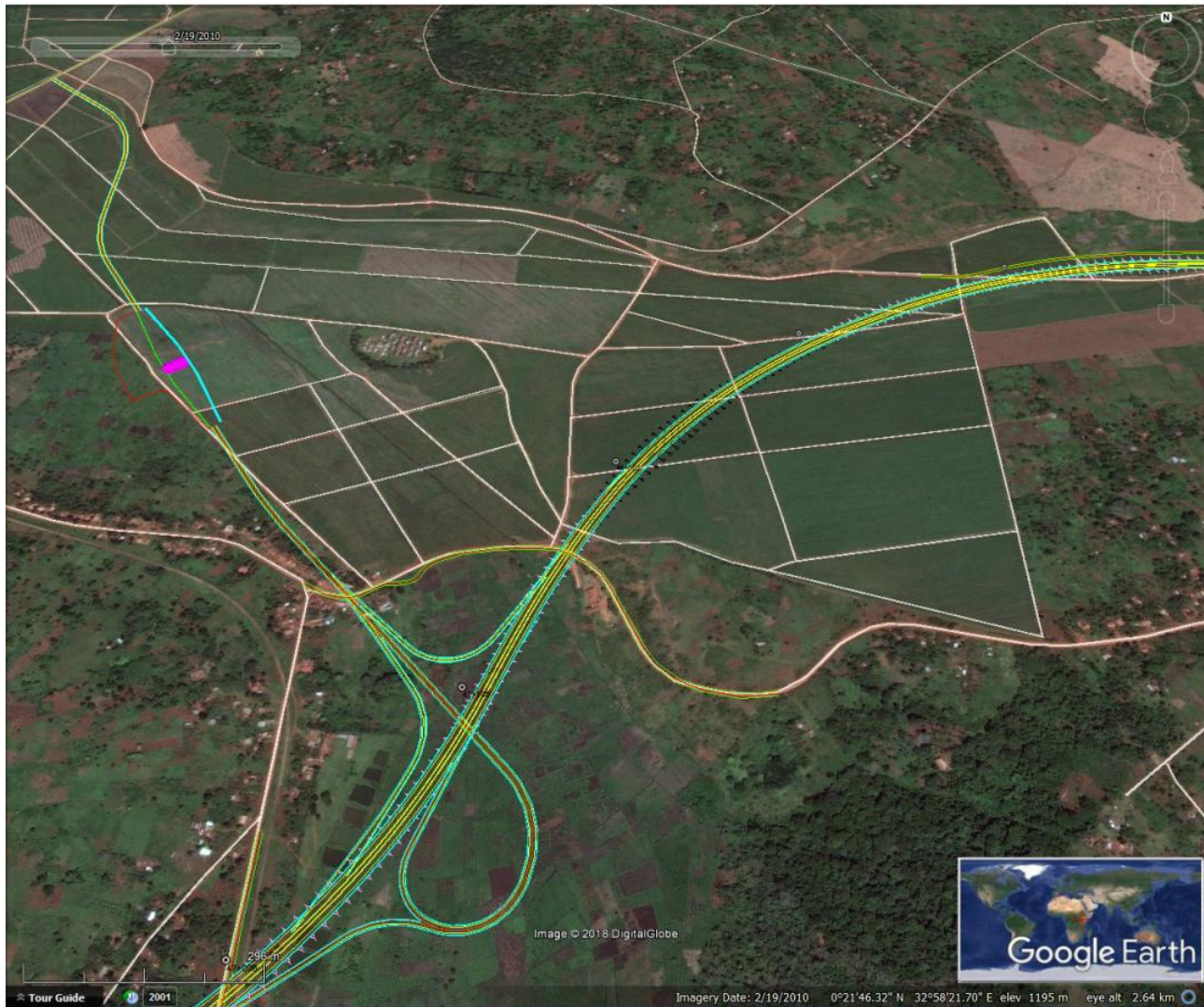
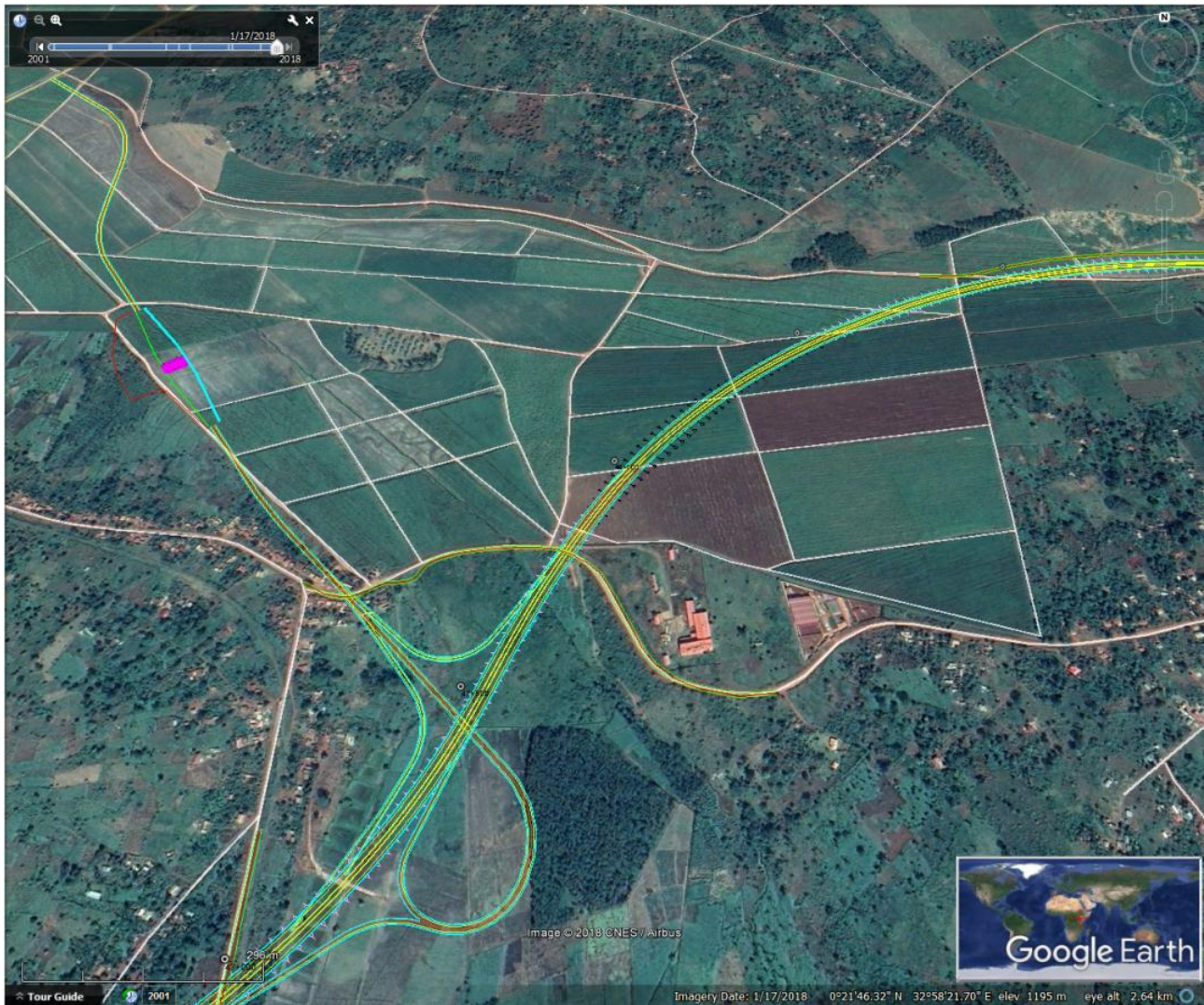


Figure 2-70 KJE Marker 48+000 land use for 2010





**Figure 2-71 KJE Marker 48+000 land use for 2018**



## 2.26 Marker 50+000

The time periods recorded for Marker 50+000 are represented in figures 2-72 to 2-73 and were recorded in the following years:

- ▶ 2010; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-72 KJE Marker 50+000 land use for 2010**





**Figure 2-73 KJE Marker 50+000 land use for 2018**



## 2.27 Marker 52+000

The time periods recorded for Marker 52+000 are represented in figures 2-74 to 2-75 and were recorded in the following years:

- ▶ 2010; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-74 KJE Marker 52+000 land use for 2010**





**Figure 2-75 KJE Marker 52+000 land use for 2018**



## 2.28 Marker 54+000

The time periods recorded for Marker 54+000 are represented in figures 2-76 to 2-77 and were recorded in the following years:

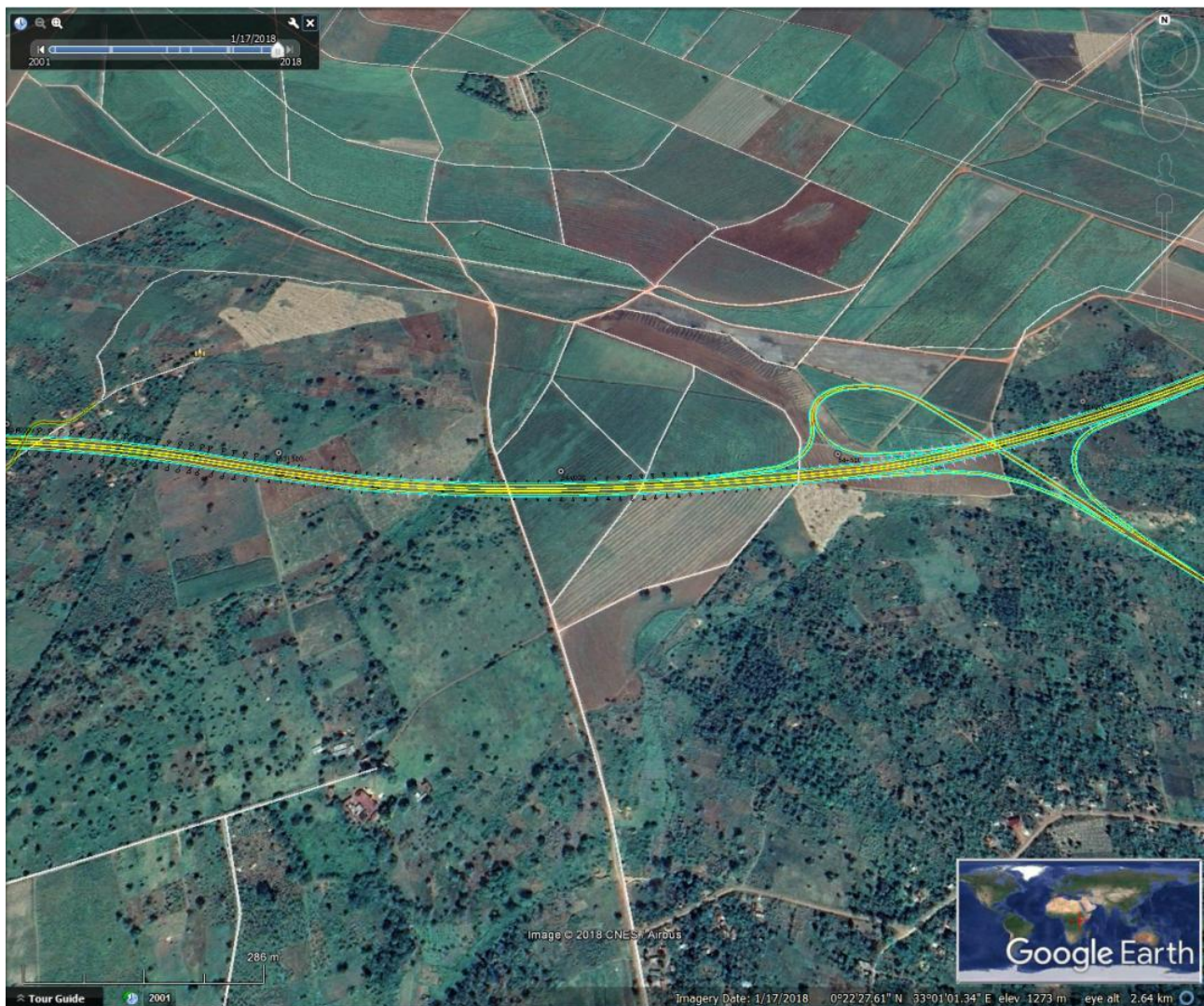
- ▶ 2011; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-76 KJE Marker 54+000 land use for 2011**





**Figure 2-77 KJE Marker 54+000 land use for 2018**



## 2.29 Marker 56+000

The time periods recorded for Marker 56+000 are represented in figures 2-78 to 2-79 and were recorded in the following years:

- ▶ 2011; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-78 KJE Marker 56+000 land use for 2011**





**Figure 2-79 KJE Marker 56+000 land use for 2018**



## 2.30 Marker 58+000

The time periods recorded for Marker 58+000 are represented in figures 2-80 to 2-81 and were recorded in the following years:

- ▶ 2011; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period.



Figure 2-80 KJE Marker 58+000 land use for 2011





**Figure 2-81 KJE Marker 58+000 land use for 2018**



## 2.31 Marker 60+000

The time periods recorded for Marker 60+000 are represented in figures 2-82 to 2-83 and were recorded in the following years:

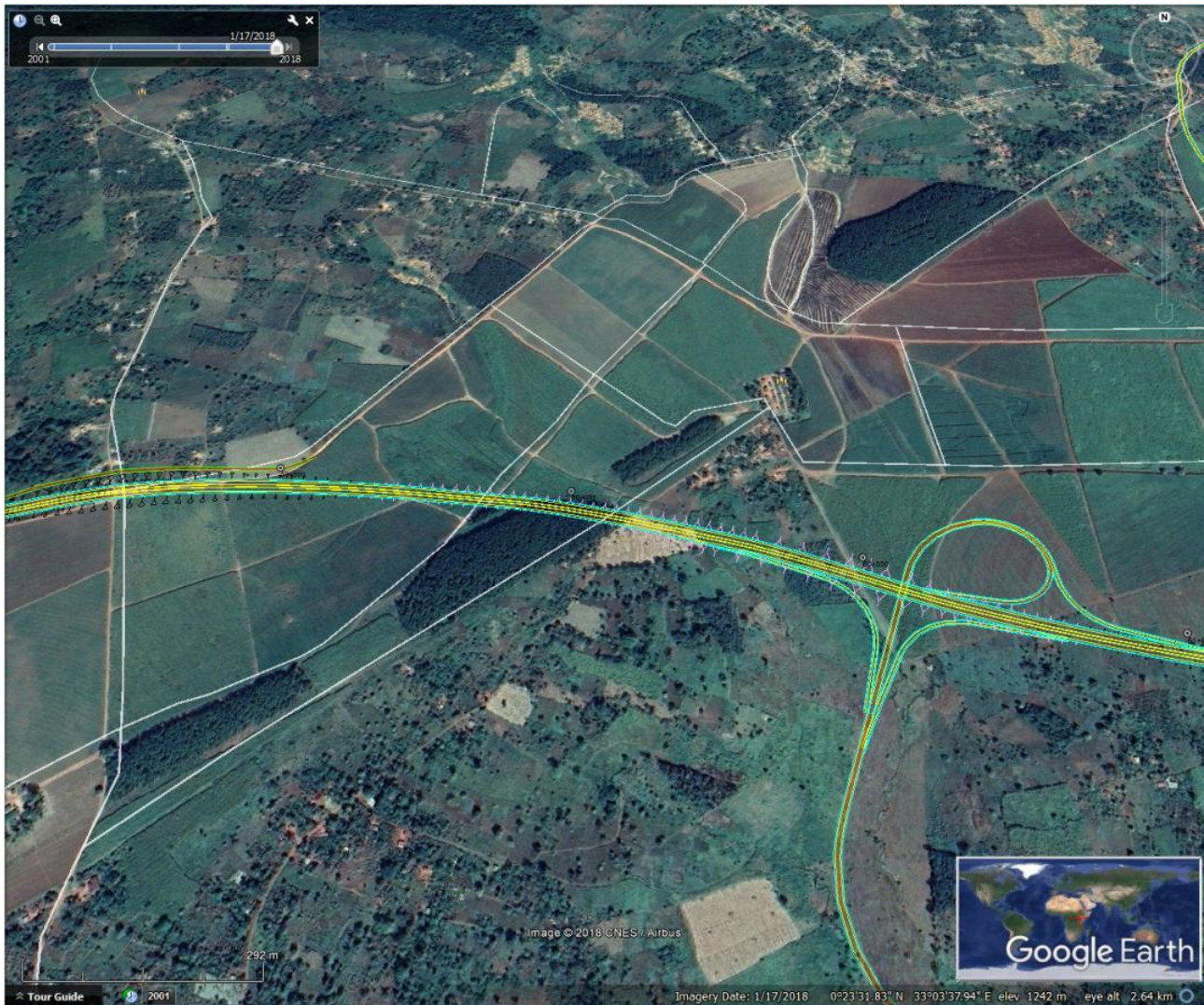
- ▶ 2011; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-82 KJE Marker 60+000 land use for 2011**





**Figure 2-83 KJE Marker 60+000 land use for 2018**



## 2.32 Marker 62+000

The time periods recorded for Marker 62+000 are represented in figures 2-84 to 2-85 and were recorded in the following years:

- ▶ 2011; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-84 KJE Marker 62+000 land use for 2011**





**Figure 2-85 KJE Marker 62+000 land use for 2018**



## 2.33 Marker 64+000

The time periods recorded for Marker 64+000 are represented in figures 2-86 to 2-87 and were recorded in the following years:

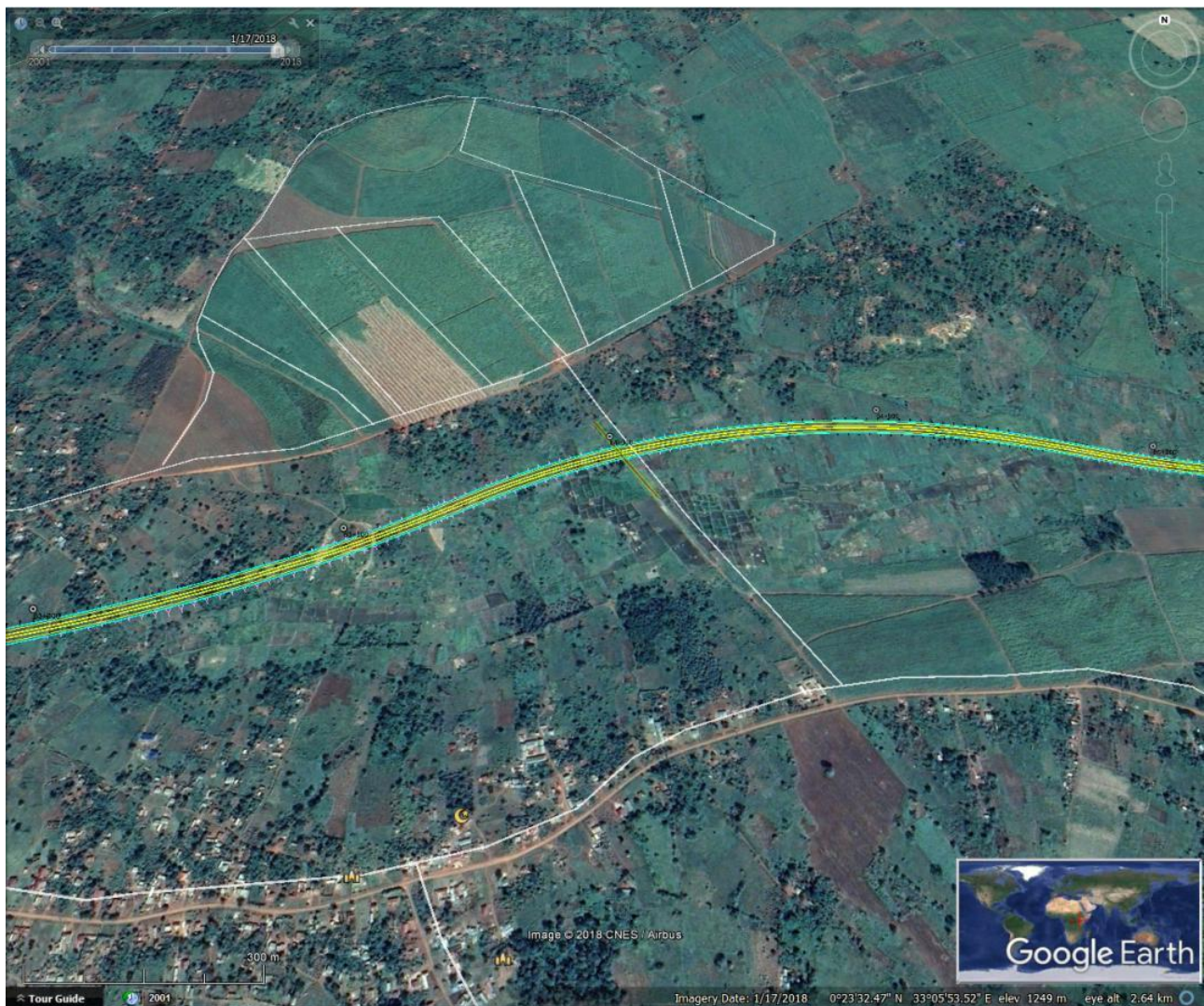
- ▶ 2011; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-86 KJE Marker 64+000 land use for 2011**





**Figure 2-87 KJE Marker 64+000 land use for 2018**

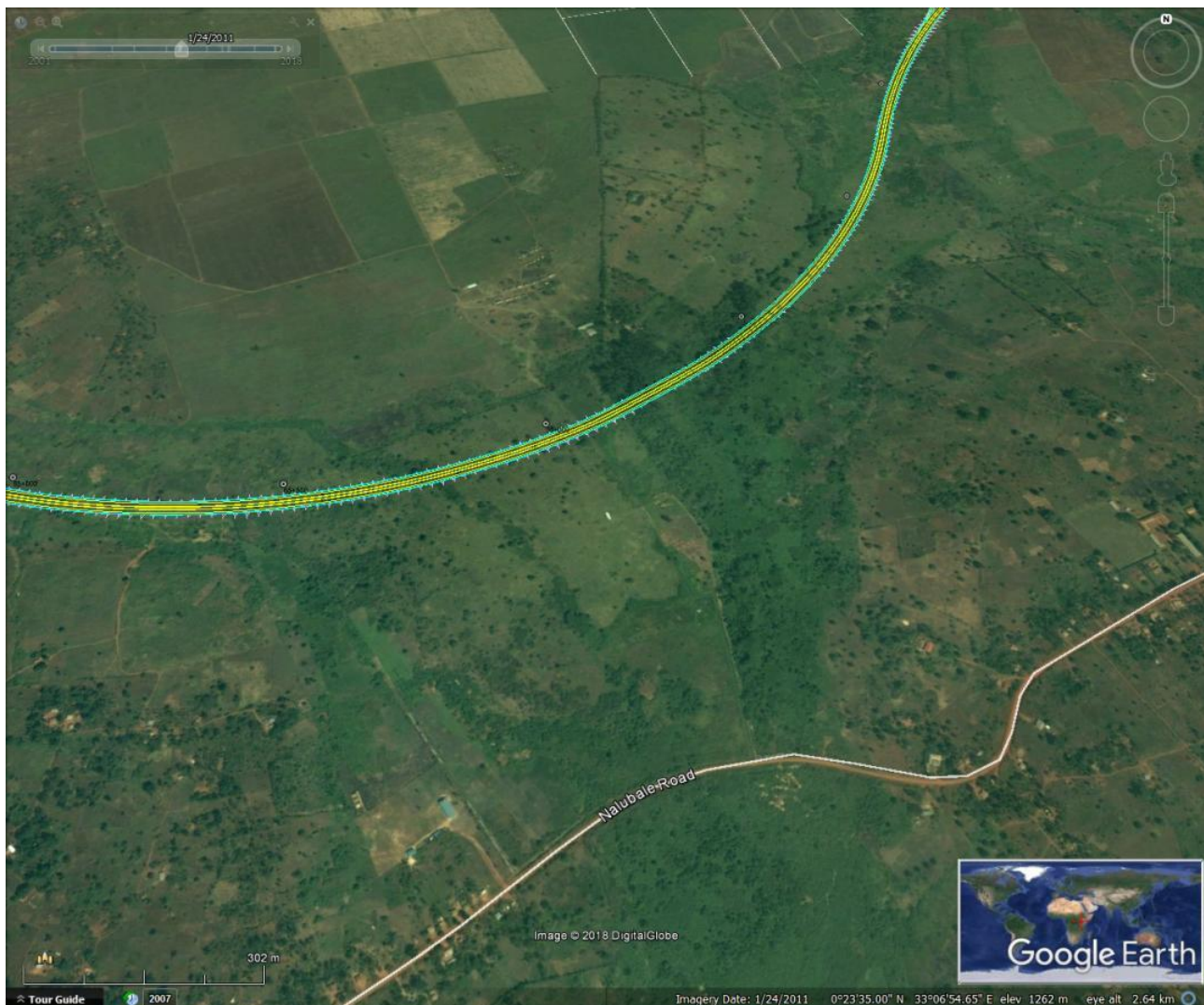


## 2.34 Marker 66+000

The time periods recorded for Marker 66+000 are represented in figures 2-88 to 2-90 and were recorded in the following years:

- ▶ 2011;
- ▶ 2014; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period. However there has been a slight increase in agricultural practices in the Southern region.



**Figure 2-88 KJE Marker 66+000 land use for 2011**





**Figure 2-89 KJE Marker 66+000 land use for 2014**



**Figure 2-90 KJE Marker 66+000 land use for 2018**



## 2.35 Marker 68+000

The time periods recorded for Marker 68+000 are represented in figures 2-91 to 2-92 and were recorded in the following years:

- ▶ 2007; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-91 KJE Marker 68+000 land use for 2007**





**Figure 2-92 KJE Marker 68+000 land use for 2018**



## 2.36 Marker 70+000

The time periods recorded for Marker 70+000 are represented in figures 2-93 to 2-94 and were recorded in the following years:

- ▶ 2007; and
- ▶ 2018.

There is no significant change in land use within the region over the surveyed time period.



**Figure 2-93 KJE Marker 70+000 land use for 2007**





**Figure 2-94 KJE Marker 70+000 land use for 2018**



## 2.37 Marker 72+000

The time periods recorded for Marker 72+000 are represented in figures 2-95 to 2-96 and were recorded in the following years:

- ▶ 2011; and
- ▶ 2017.

There is no significant change in land use within the region over the surveyed time period. However there has been a factory site developed in the North East region.

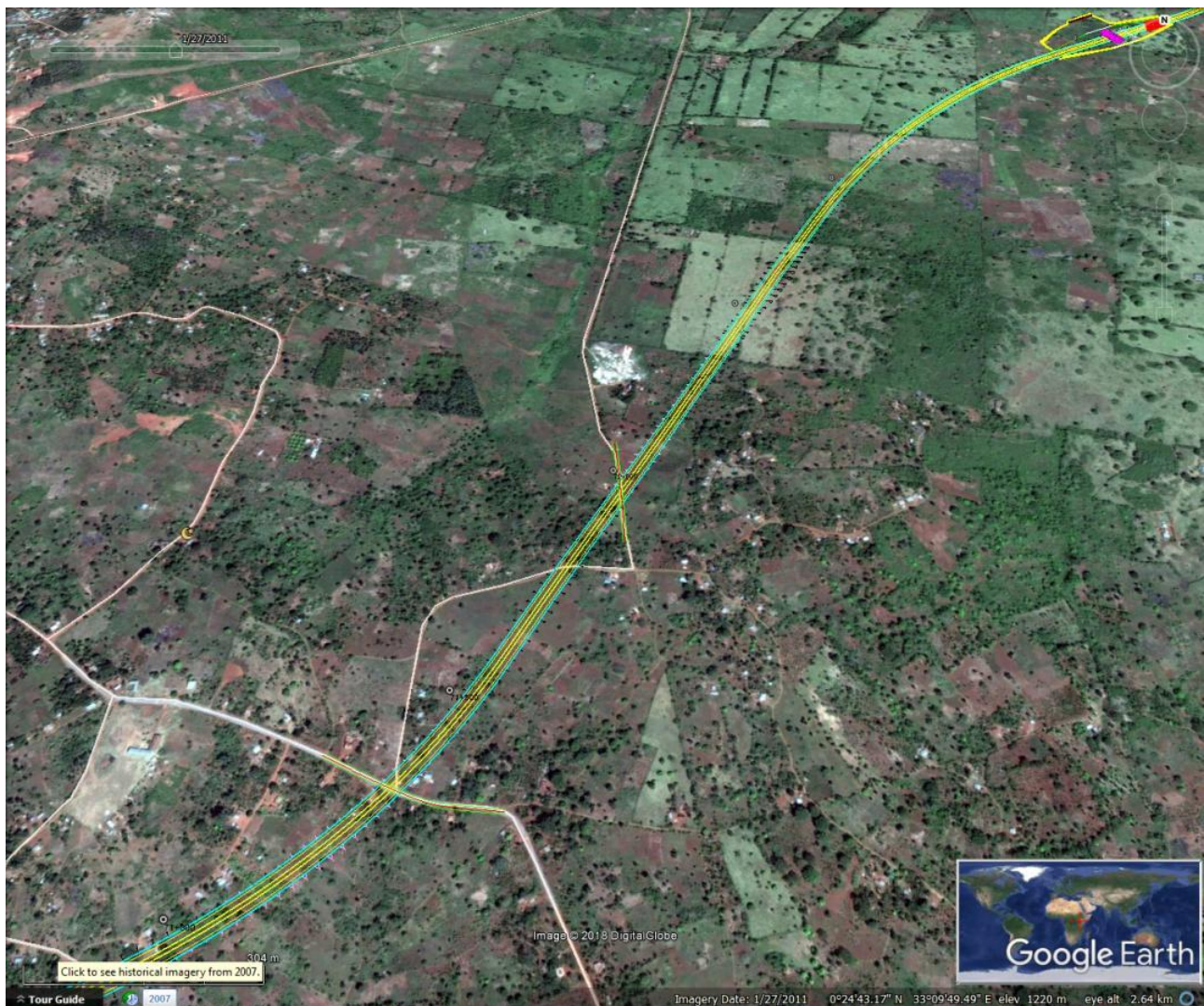


Figure 2-95 KJE Marker 72+000 land use for 2011





**Figure 2-96 KJE Marker 72+000 land use for 2018**



## 2.38 Marker 74+000

The time periods recorded for Marker 74+000 are represented in figures 2-97 to 2-99 and were recorded in the following years:

- ▶ 2007;
- ▶ 2014; and
- ▶ 2017.

There has been a significant increase in urban development the North Western region, transitioning from agricultural regions. The South Eastern region are predominantly agricultural areas.

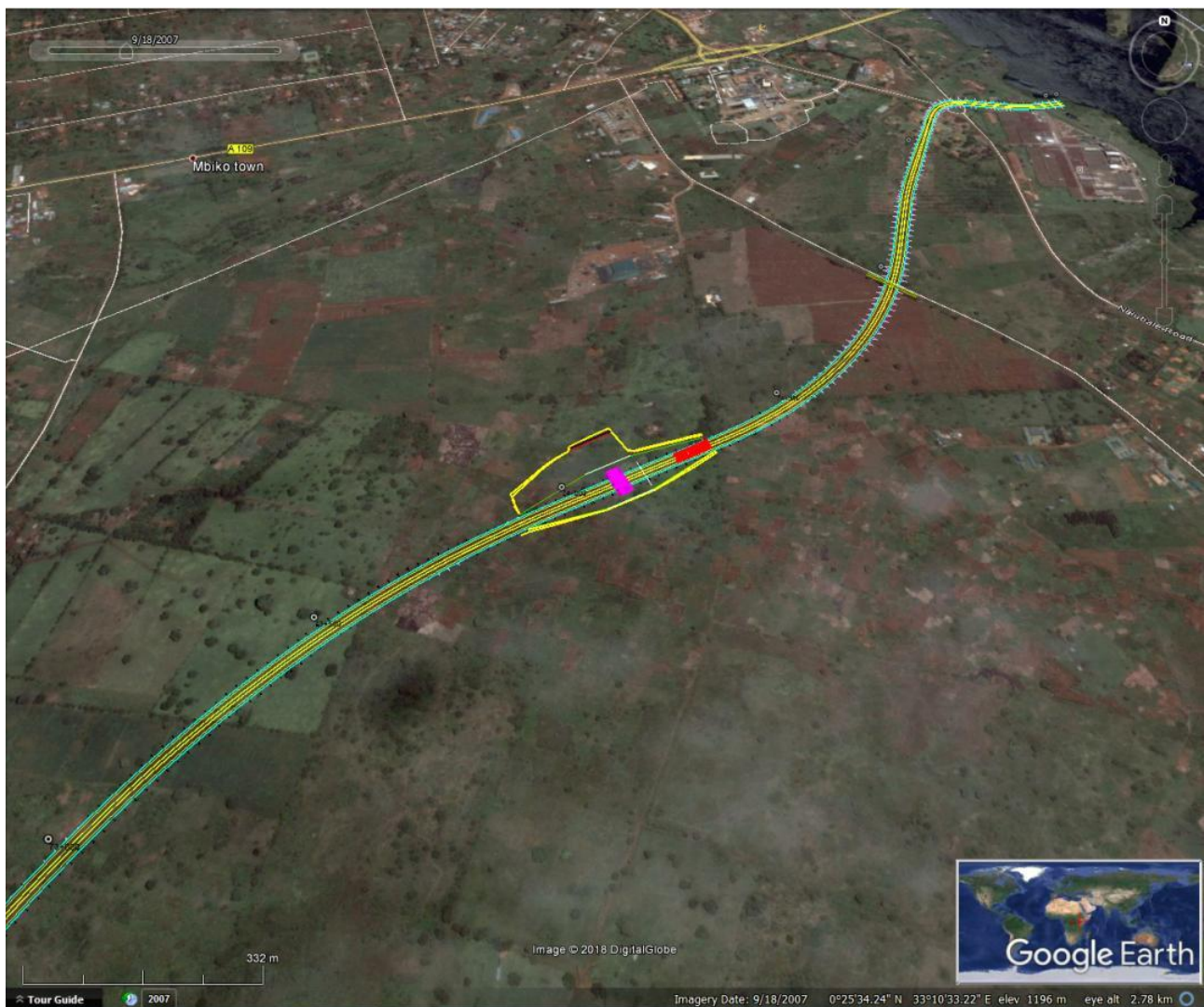


Figure 2-97 KJE Marker 74+000 land use for 2007





**Figure 2-98 KJE Marker 74+000 land use for 2014**



**Figure 2-99 KJE Marker 74+000 land use for 2018**



## 2.39 Marker 76+000

The time periods recorded for Marker 76+000 are represented in figures 2-100 to 2-102 and were recorded in the following years:

- ▶ 2007;
- ▶ 2014; and
- ▶ 2018.

There has been little land use change within the region, however between 2014 and 2018 a bridge has begun development across the Victoria Nile.



Figure 2-100 KJE Marker 76+000 land use for 2007





Figure 2-101 KJE Marker 76+000 land use for 2014





Figure 2-102 KJE Marker 76+000 land use for 2018



### 3. KSB MAINLINE

#### 3.1 Junction 1

The time periods recorded for are represented in figures 3-1 to 3-3 and were recorded in the following years:

- ▶ 2000;
- ▶ 2008; and
- ▶ 2017.

There has been a clear change in land use at the initial junction of the KSB Mainline. From 2000 to 2008 there was a relatively small increase in housing and road systems and a decrease in forests and vegetation, with the Western region of the area dominated by swamplands. From 2008 and 2017 the majority of the swamplands have been cleared for agricultural practices and a major roadway. Whereas the Eastern region has had a significant increase in housing and road systems and a decreased in forested regions.

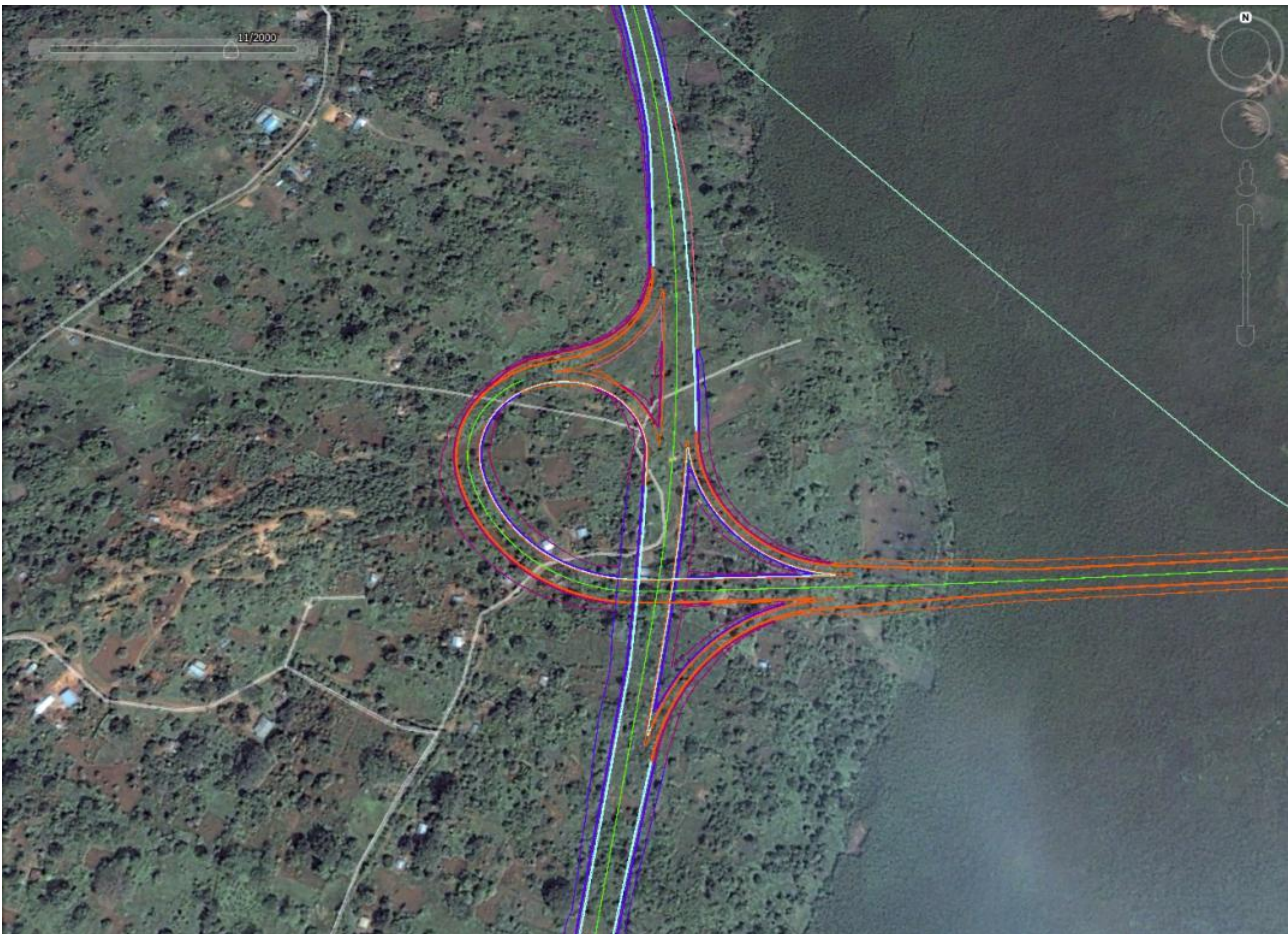


Figure 3-1 KSB Junction 1 land use for 2000



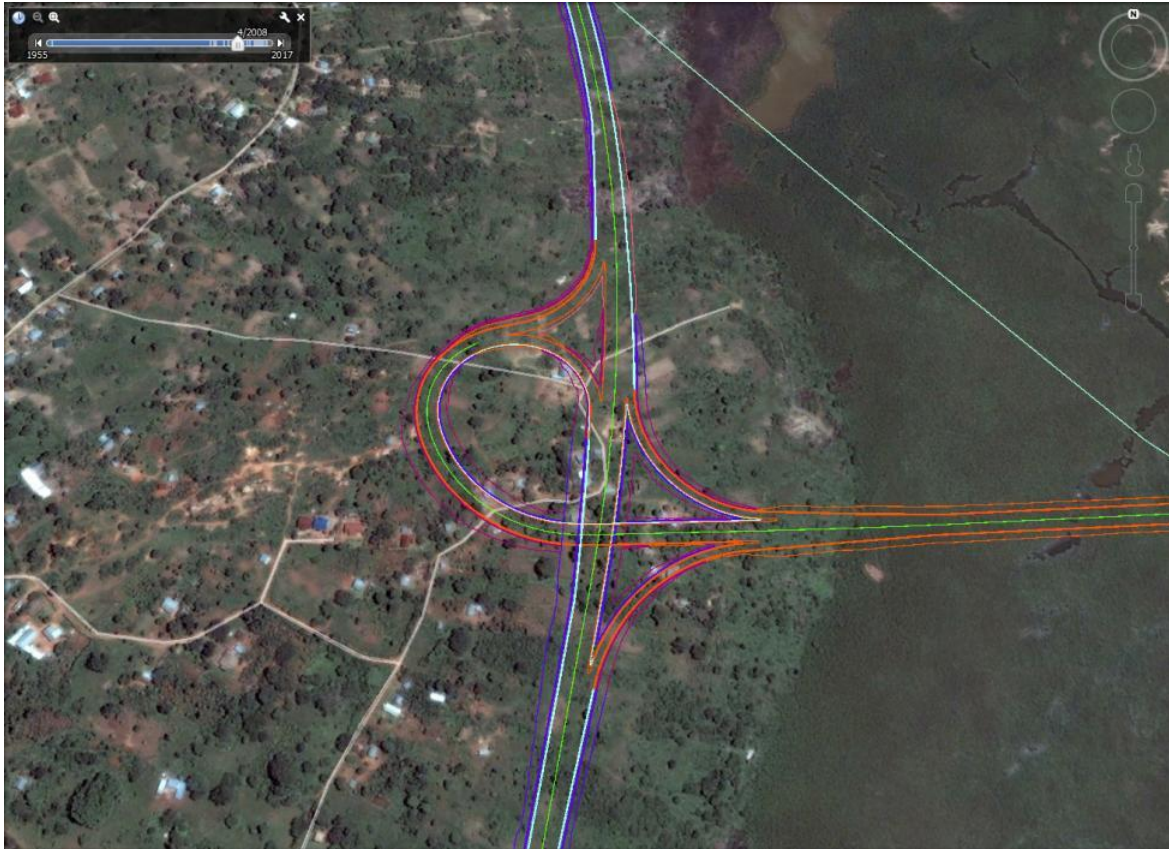


Figure 3-2 KSB Junction 1 land use for 2008

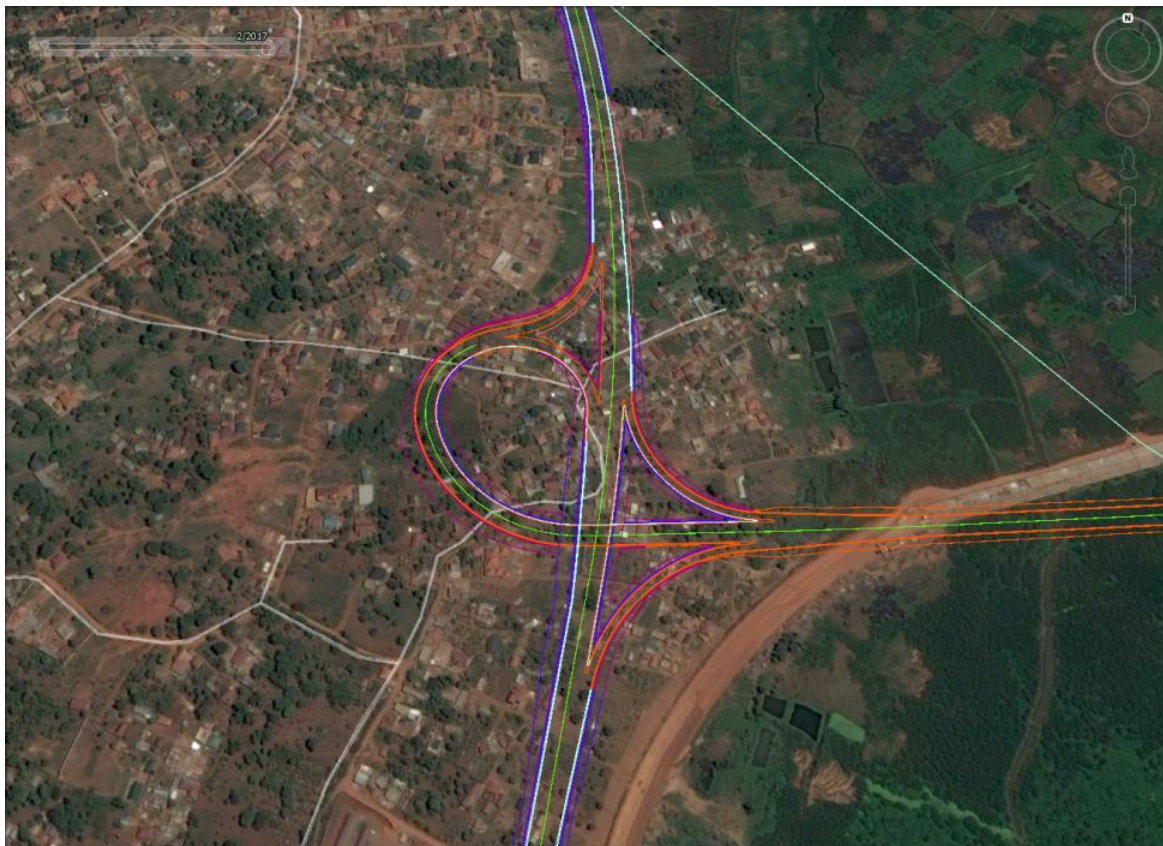


Figure 3-3 KSB Mainline, Junction 1 land use for 2017



## 3.2 Kiwenyu

The time periods recorded for are represented in figures 3-4 to 3-6 and were recorded in the following years:

- ▶ 2000;
- ▶ 2008; and
- ▶ 2017.

There has been a clear change in land use within the Kiwenyu town of the KSB Mainline. From 2000 to 2008 there was a relatively large increase in housing and road systems and a decrease in forests and vegetation, however there is still a small section of swampland in the South Western region. This trend has continued from 2008 to 2017 with most of the land are dominated by housing and road systems. The small region of swampland was also converted to agricultural lands.

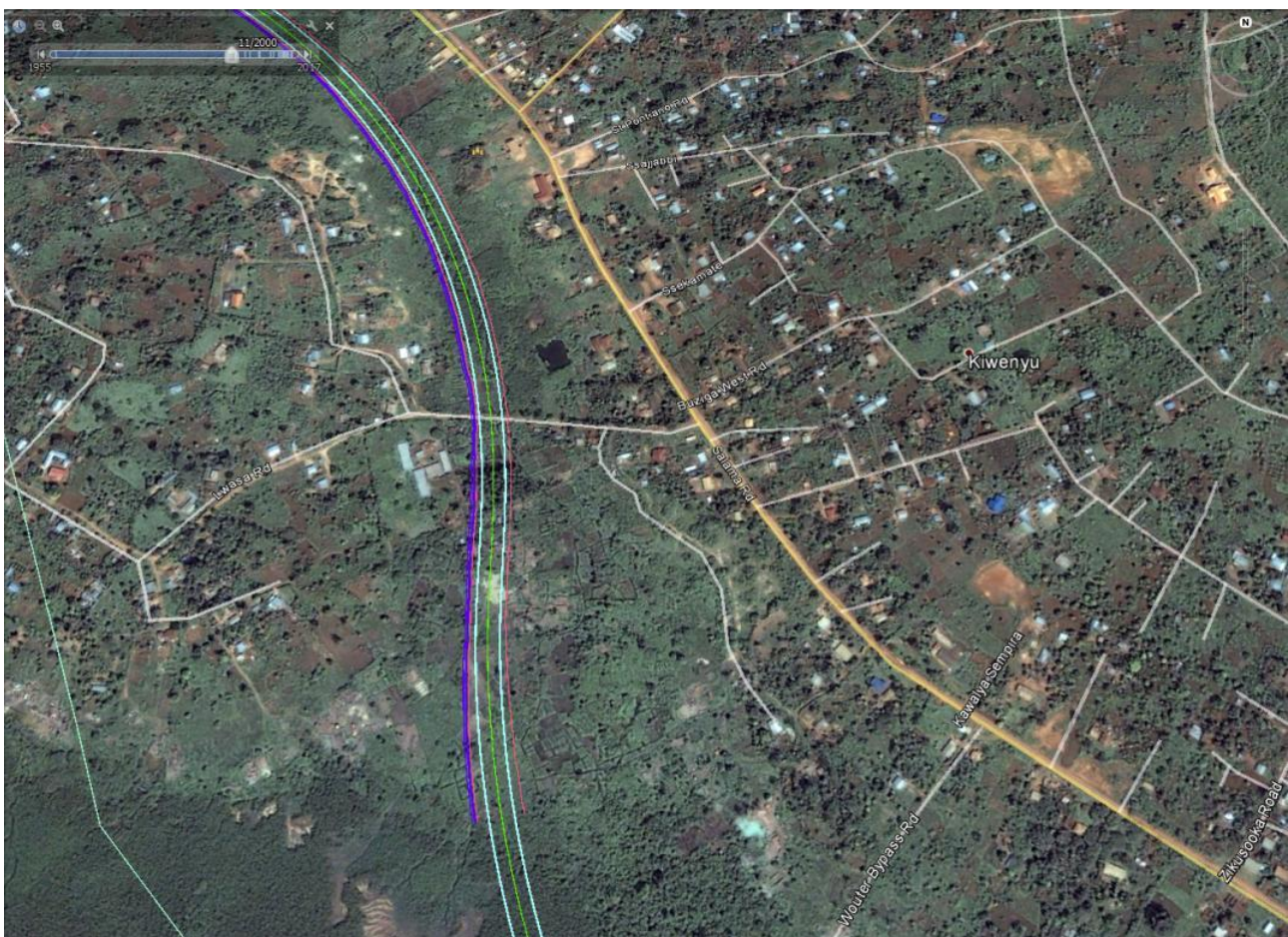


Figure 3-4 KSB Mainline, Kiwenyu land use for 2000







### 3.3 Luwafu

The time periods recorded for are represented in figures 3-7 to 3-9 and were recorded in the following years:

- ▶ 2000;
- ▶ 2008; and
- ▶ 2017.

There has been a clear change in land use within the Luwafu town of the KSB Mainline. From 2000 to 2008 there was a relatively large increase in housing and road systems and a decrease in forests and vegetation. This trend has continued from 2008 to 2017 with most of the land are dominated by housing and road systems.



Figure 3-7 KSB Mainline, Luwafu land use for 2000





Figure 3-8 KSB Mainline, Luwafu land use for 2008



Figure 3-9 KSB Mainline, Luwafu land use for 2017



### 3.4 Konge Hill

The time periods recorded for are represented in figures 3-10 to 3-12 and were recorded in the following years:

- ▶ 2000;
- ▶ 2008; and
- ▶ 2017.

There has been a clear change in land use within the Konge Hill town of the KSB Mainline. From 2000 to 2008 there was a relatively large increase in housing and road systems and a decrease in forests and vegetation. This trend has continued from 2008 to 2017 with most of the land are dominated by housing and road systems. However the North West region of Konge Hill still maintains some vegetated areas.

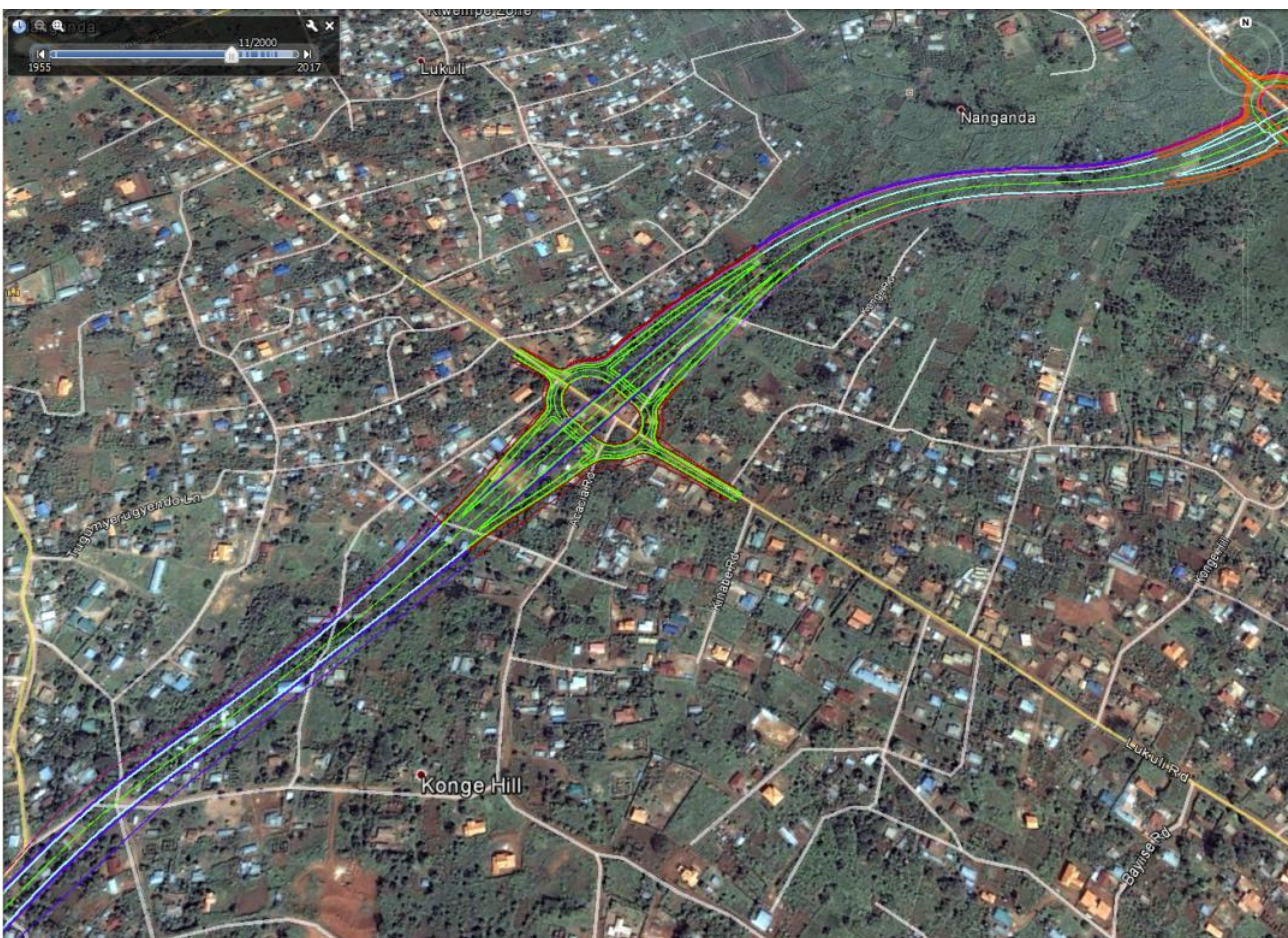


Figure 3-10 KSB Mainline, Konge Hill land use for 2000







### 3.5 Kyeitabya

The time periods recorded for are represented in figures 3-13 to 3-15 and were recorded in the following years:

- ▶ 2000;
- ▶ 2011; and
- ▶ 2017.

There has been a clear change in land use within the Kyeitabya town of the KSB Mainline. From 2000 to 2008 there was a relatively large increase in housing and road systems and a decrease in forests and vegetation. This trend has continued from 2011 to 2017 with most of the land are dominated by housing and road systems. To the West of this town there is extensive swamp lands and a significant. The watercourse has increased extensively over the sample period, however this may be due to seasonal fluctuation in rainfall.

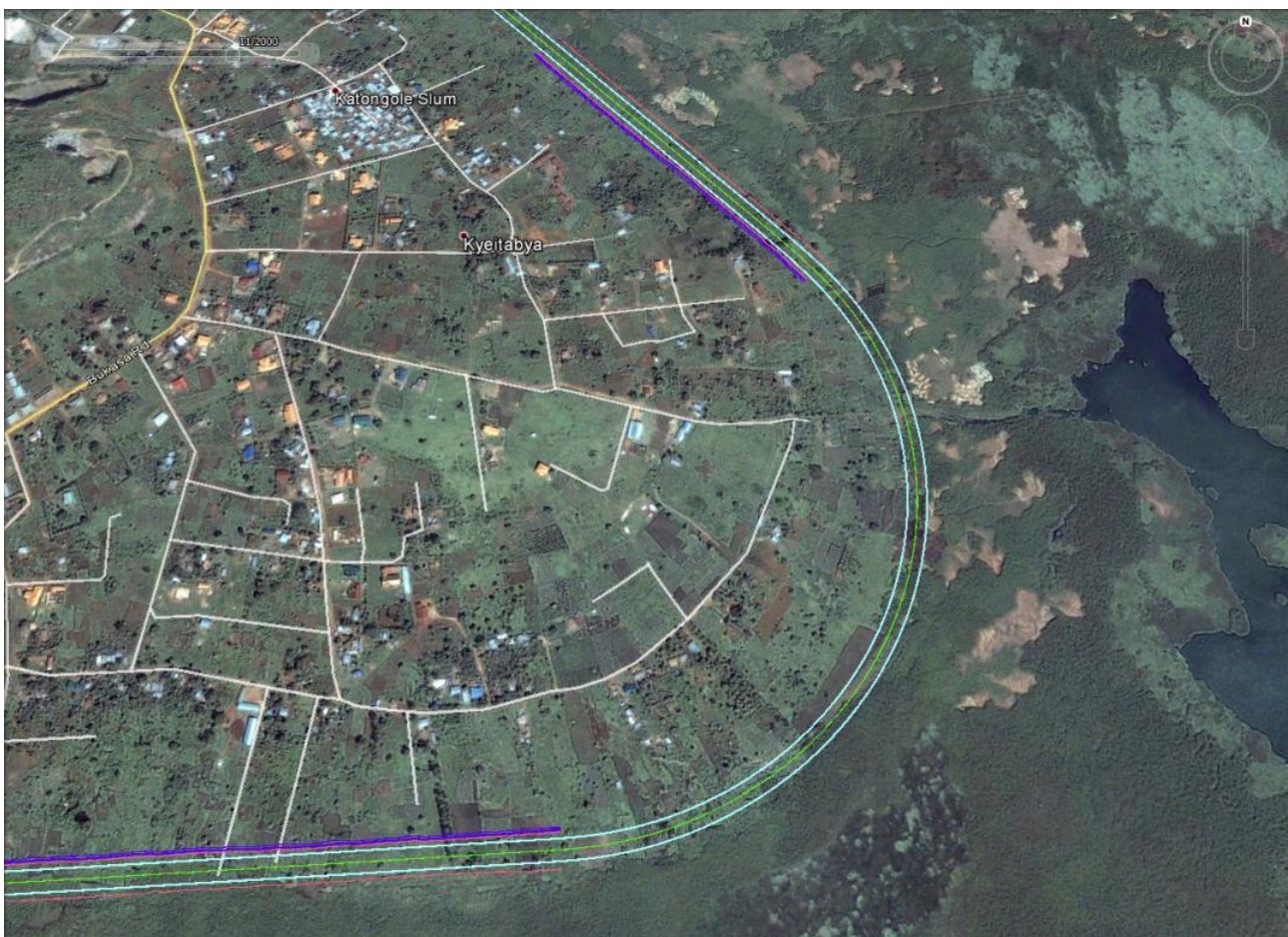


Figure 3-13 KSB Mainline, Kyeitabya land use for 2000



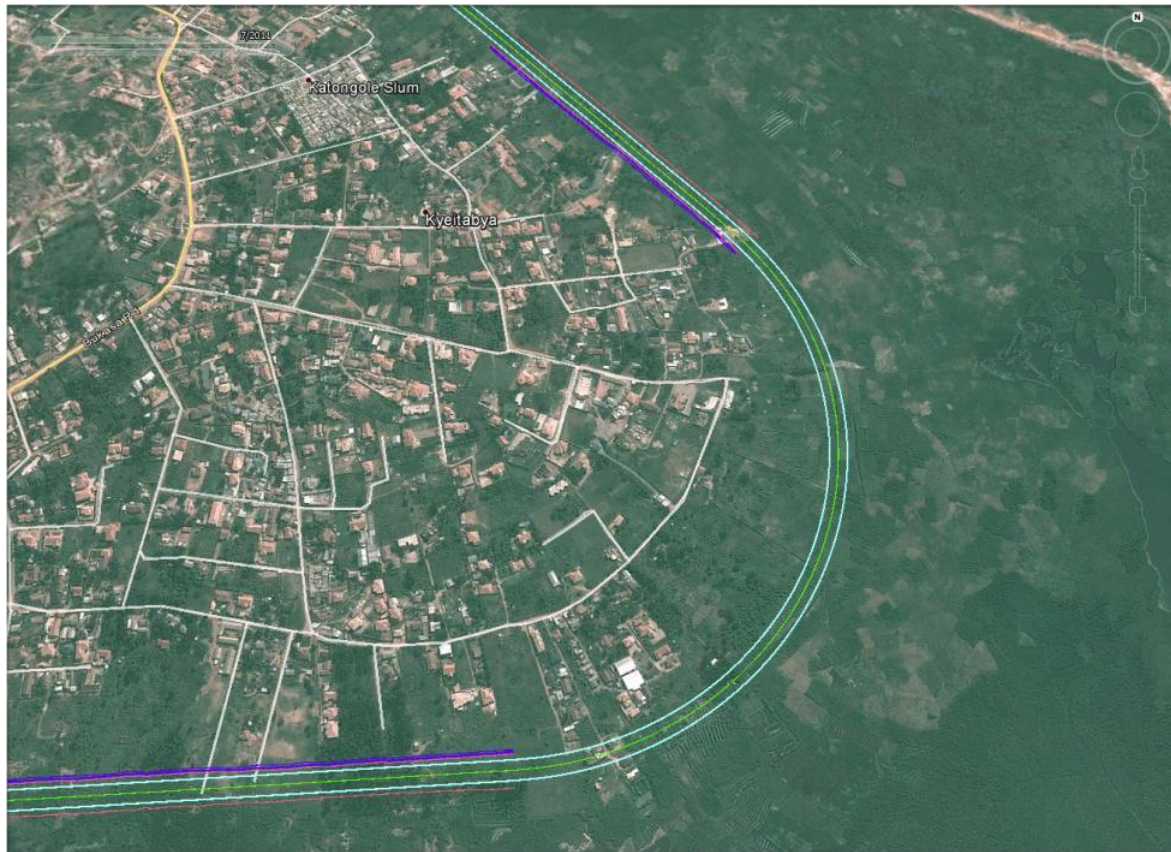


Figure 3-14 KSB Mainline, Kyeitabya land use for 2011



Figure 3-15 KSB Mainline, Kyeitabya land use for 2017



### 3.6 Bukasa

The time periods recorded for are represented in figures 3-16 to 3-18 and were recorded in the following years:

- ▶ 2000;
- ▶ 2008; and
- ▶ 2017.

There has been a clear change in land use within the Bukasa town of the KSB Mainline. From 2000 to 2008 there was a relatively large increase in housing and road systems and a decrease in forests and vegetation. This trend has continued from 2008 to 2017 with most of the land are dominated by housing and road systems. However the North West region of Bukasa still maintains a large vegetated area.



Figure 3-16 KSB Mainline, Bukasa land use for 2000





Figure 3-17 KSB Mainline, Bukasa land use for 2008

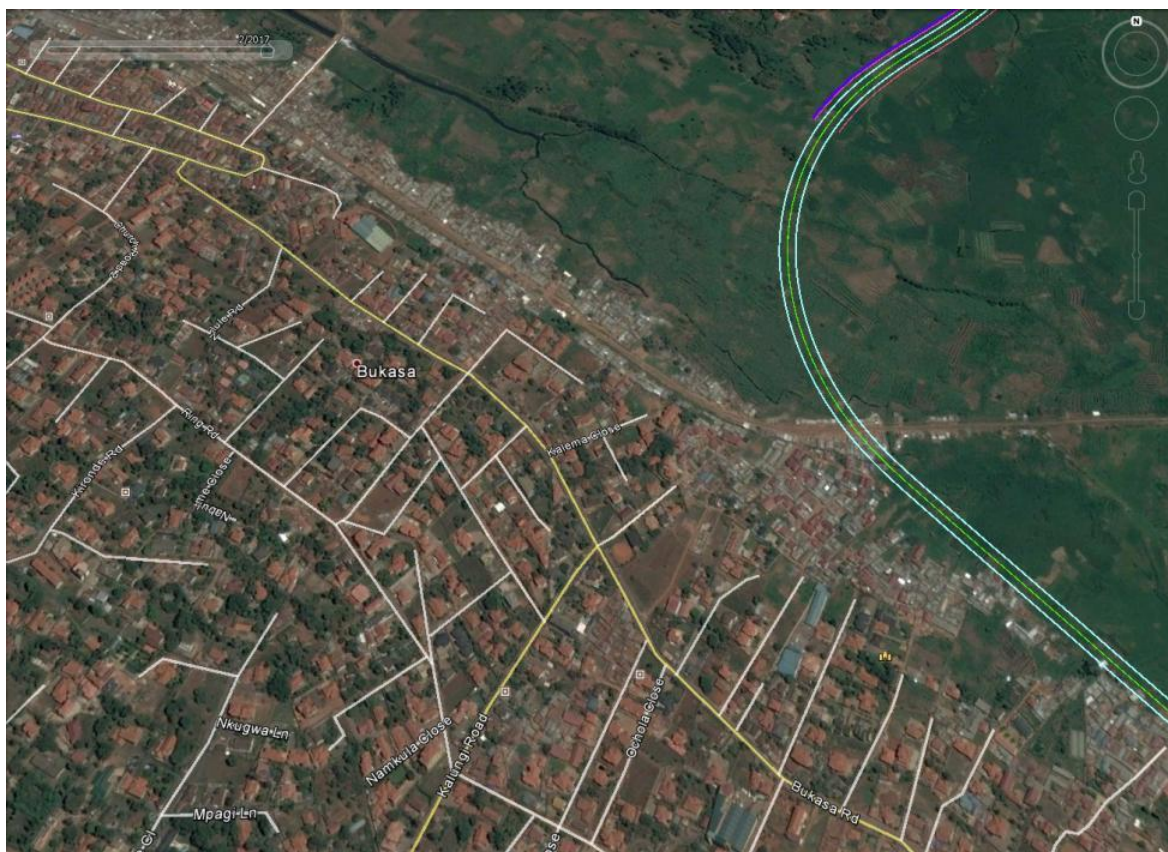


Figure 3-18 KSB Mainline, Bukasa land use for 2017



### 3.7 Mpanga

The time periods recorded for are represented in figures 3-19 to 3-20 and were recorded in the following years:

- ▶ 2000;
- ▶ 2008; and
- ▶ 2018.

There has been a clear change in land use within the Mpanga town of the KSB Mainline. From 2000 to 2008 there was a relatively large increase in housing, factories and road systems and a decrease in forests and vegetation. This trend has continued from 2008 to 2017 with most of the land are dominated by housing, factories and road systems. However the Eastern region of Mpanga still maintains a largely vegetated area. Amongst the development in the western region there are still some areas of vegetation remaining.



Figure 3-19 KSB Mainline, Mpanga land use for 2000





Figure 3-20 KSB Mainline, Mpanga land use for 2008



Figure 3-21 KSB Mainline, Mpanga land use for 2018



### 3.8 Bugolobi

The time periods recorded for are represented in figures 3-22 to 3-24 and were recorded in the following years:

- ▶ 2002;
- ▶ 2010; and
- ▶ 2018.

The land use in Bugolobi is predominantly urban and housing regions. From 2002 to 2010 there was a relatively large increase in housing, factories and road systems and a decrease in vegetation and open areas. This trend has continued from 2010 to 2018 with most of the land are dominated by housing, factories and road systems.

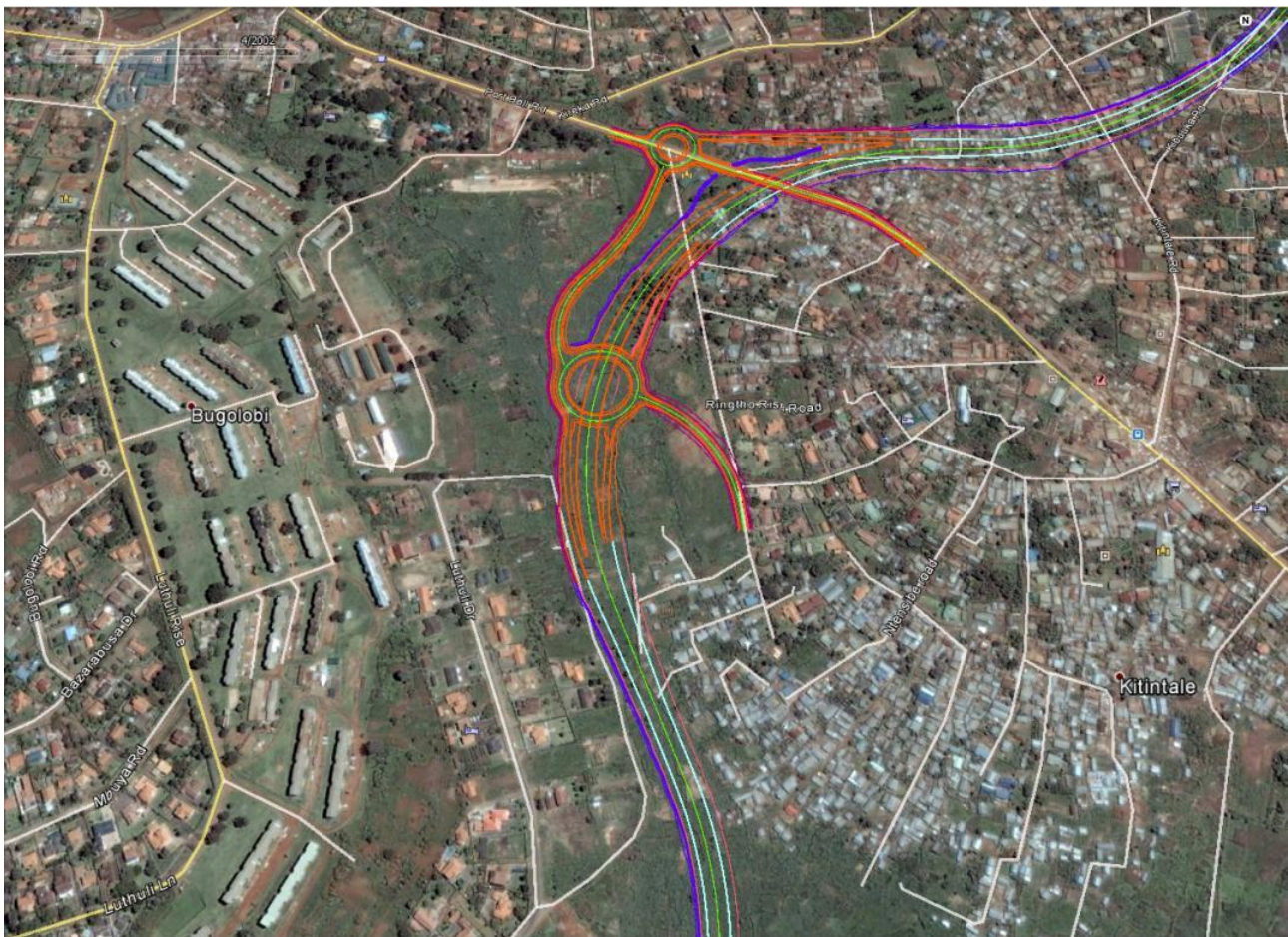


Figure 3-22 KSB Mainline, Bugolobi land use for 2002







### 3.9 Mutongo Hill

The time periods recorded for are represented in figures 3-25 to 3-27 and were recorded in the following years:

- ▶ 2002;
- ▶ 2010; and
- ▶ 2018.

The land use in Mutongo Hill is predominantly urban and housing regions. From 2002 to 2010 there was a relatively large increase in housing, factories and road systems and a decrease in vegetation and open areas. This trend has continued from 2010 to 2018 with most of the land are dominated by housing, factories and road systems.

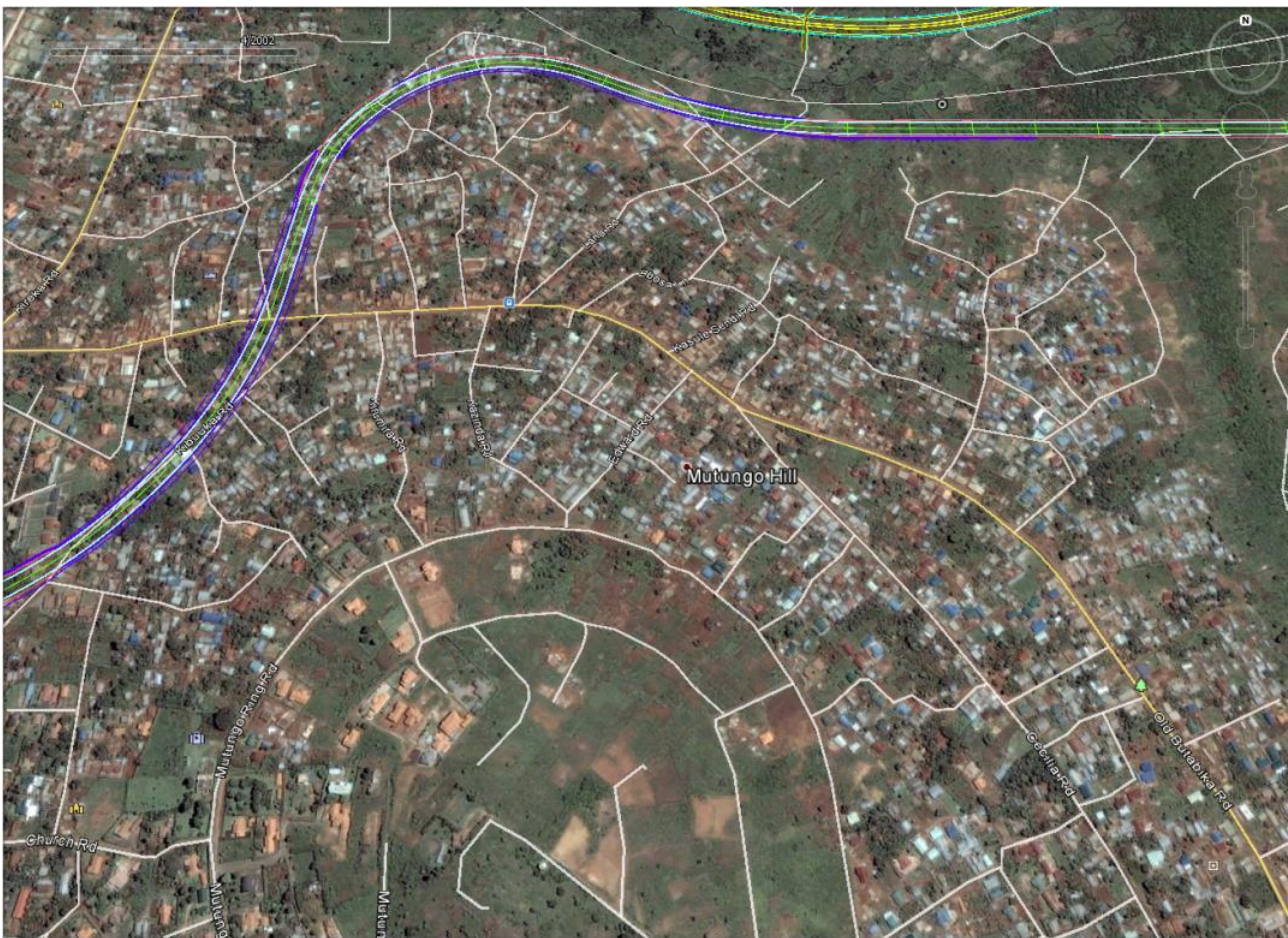


Figure 3-25 KSB Mainline, Mutongo Hill land use for 2002



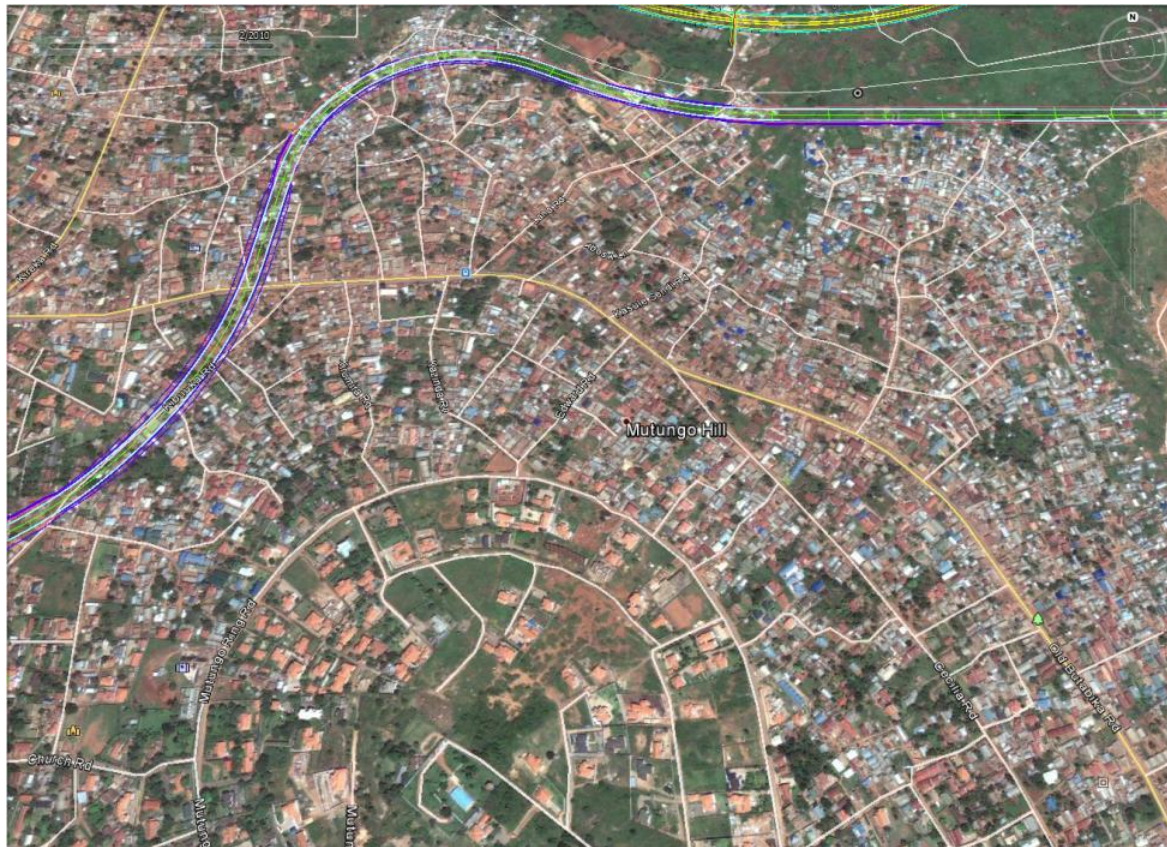


Figure 3-26 KSB Mainline, Mutungo Hill land use for 2010



Figure 3-27 KSB Mainline, Mutungo Hill land use for 2018



### 3.10 KSB and KJE Junction

The time periods recorded for are represented in figures 3-28 to 3-30 and were recorded in the following years:

- ▶ 2002;
- ▶ 2010; and
- ▶ 2018.

The land use at the KSB and KJE Junction has shifted from predominantly open areas and wetlands and swamps to urban and residential areas. From 2002 to 2010 there was a relatively large increase in housing, factories and road systems and a decrease in vegetation and open areas. This trend has continued from 2010 to 2018 with most of the land are dominated by housing, factories and road systems. However at the KSB and KJE Junction wetland corridor below the project mainline has persisted.

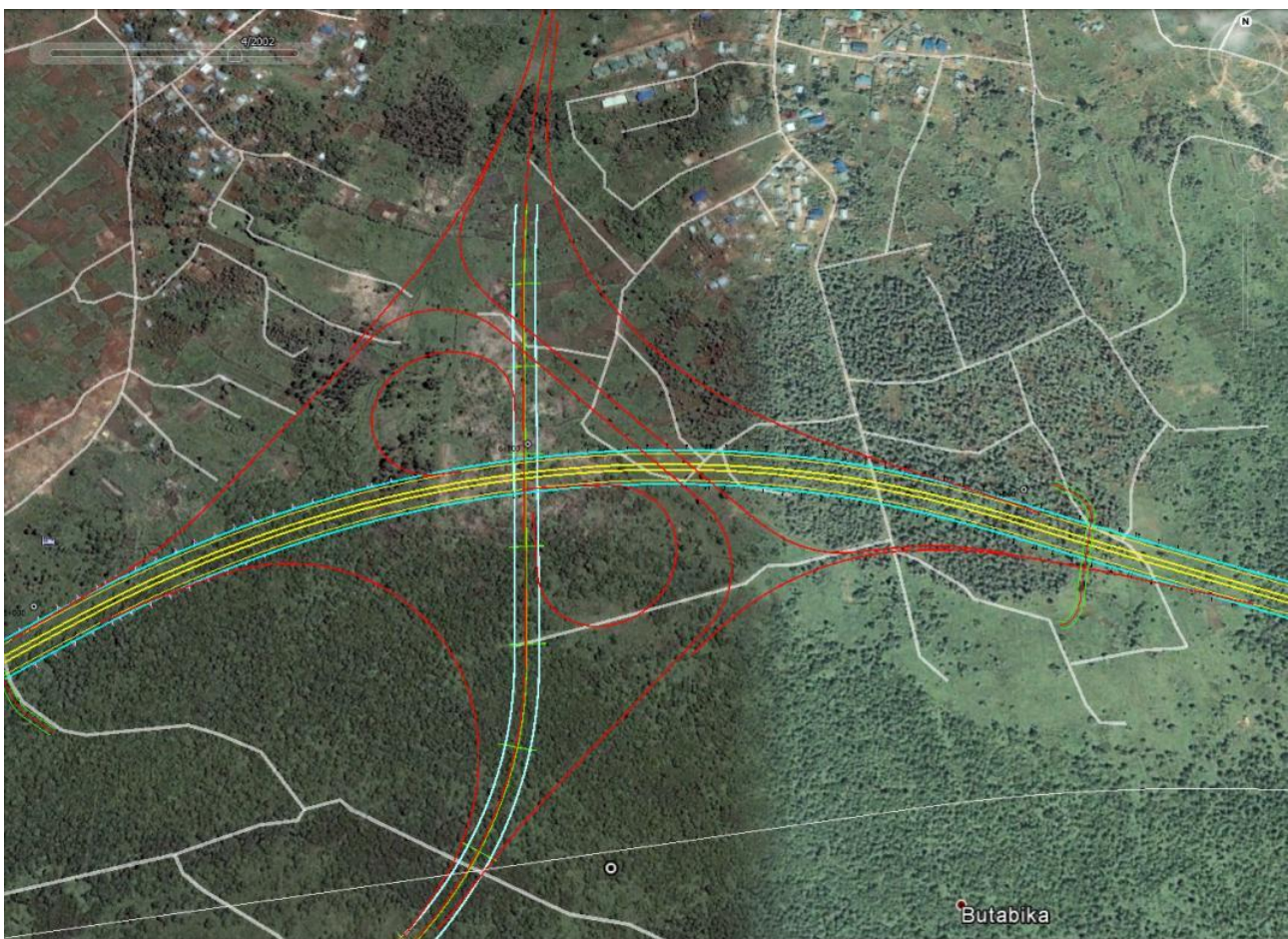


Figure 3-28 KSB Mainline, KSB and KJE Junction land use for 2002



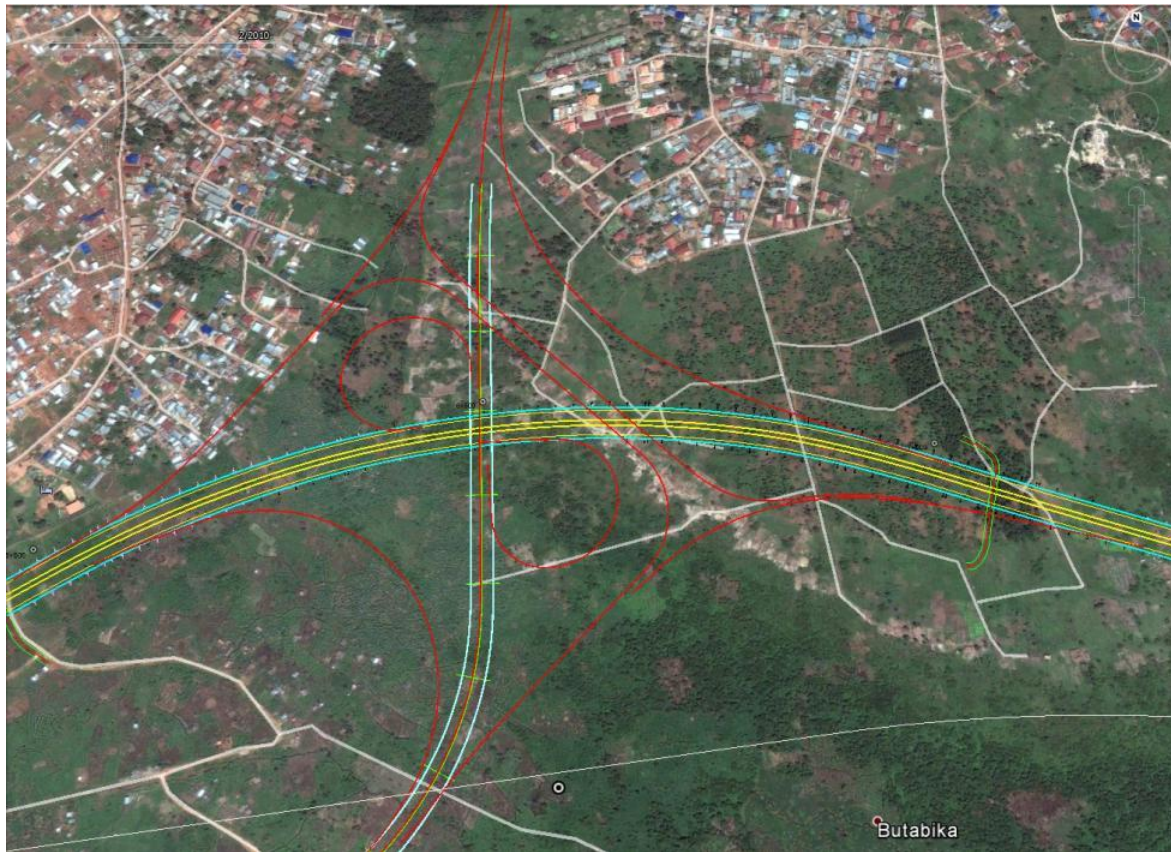


Figure 3-29 KSB Mainline, KSB and KJE Junction land use for 2010



Figure 3-30 KSB Mainline, KSB and KJE Junction land use for 2018



The time periods recorded for are represented in figures 3-31 to 3-33 and were recorded in the following years:

- ▶ 2002;
- ▶ 2010; and
- ▶ 2018.

The land use at the Jinja Road Junction is predominantly urban and housing regions. From 2002 to 2010 there was a relatively large increase in housing, factories and road systems and a decrease in vegetation and open areas. This trend has continued from 2010 to 2018 with most of the land are dominated by housing, factories and road systems. However where the KSB Mainline is proposed the land use has remained unchanged and open.



**Figure 3-31 KSB Mainline, Jinja Road Junction land use for 2002**





Figure 3-32 KSB Mainline, Jinja Road Junction land use for 2010



Figure 3-33 KSB Mainline, Jinja Road Junction land use for 2018



## 4. CONCLUSIONS

### 4.1 KJE

The following conclusions for the KJE Mainline have been made:

- ▶ Within urbanised regions there has been significant change to the land use along the KJE Mainline with roads, housing and factories intersection the proposed Project region;
- ▶ Along the KJE Mainline the Kasokoso and Kinawataka towns have seen the greatest change in land use;
- ▶ Significant land use changes have occurred in all urban areas, typically shifting from open grassland regions to residential and small industrial areas; and
- ▶ For the majority of the KJE Mainline the land use has not changed over the last 20 years, with the regions between Kampala and Jinja remaining largely unchanged.

### 4.2 KSB

The following conclusions for the KSB Mainline have been made:

- ▶ Within urbanised regions there has been significant change to the land use along the KSB Mainline with roads, housing and factories intersection the proposed Project region;
- ▶ Land use along the KSB Mainline has changed across all examined sites;
- ▶ The KSB Mainline was initially dominated by open grassland areas or swampland areas;
- ▶ The KSB Mainline is now typically dominated by residential and small industrial areas; and
- ▶ The majority of wetlands and swamps along the KSB Mainline have been converted to agricultural lands.



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