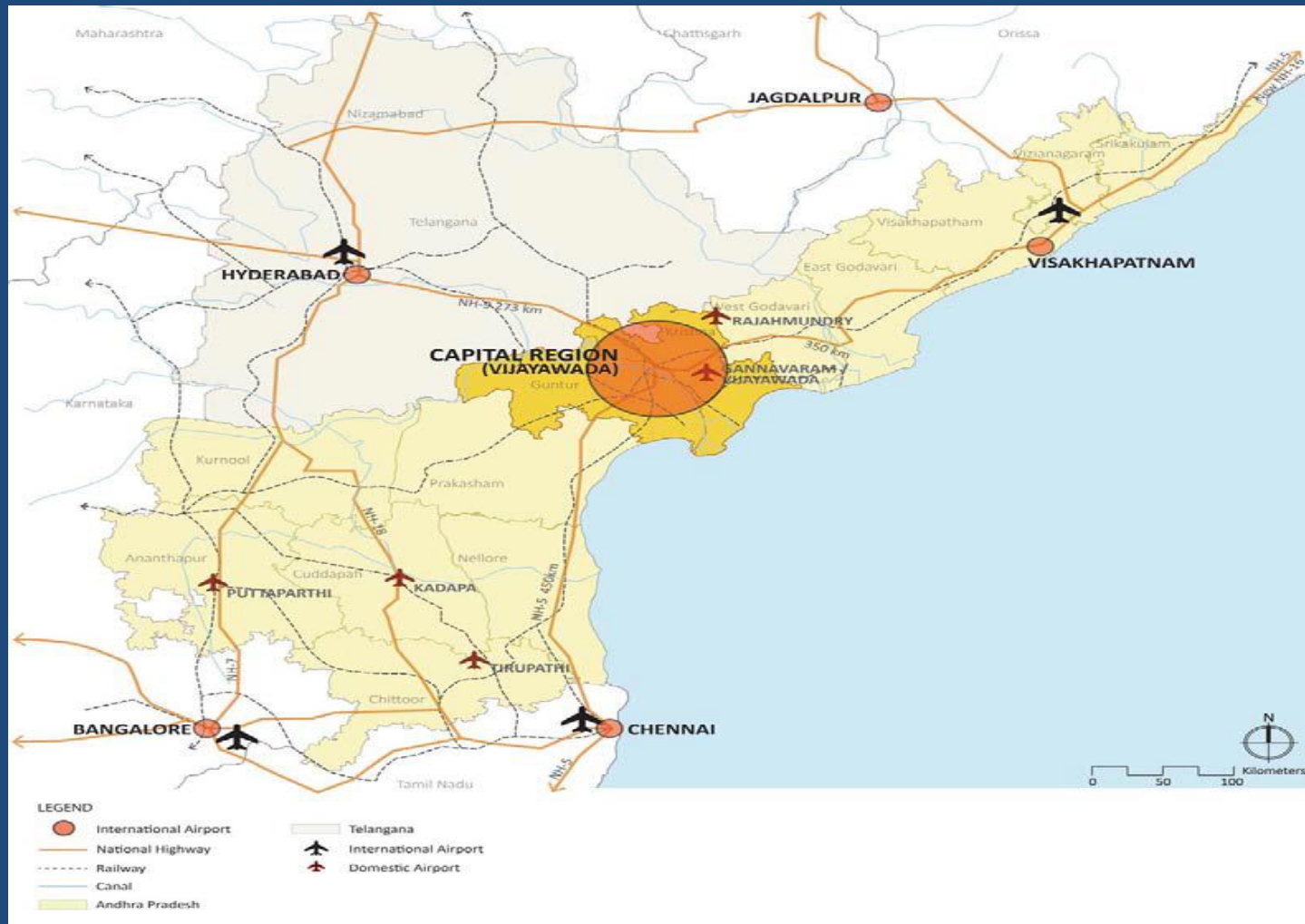


# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



# **BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI**

**In 2013, the Indian Government announced that Andhra Pradesh will be split into two states.**

**The bifurcation of states left Andhra Pradesh without a capital.**

**The old capital, Hyderabad, is now located in the new state of Telangana.**

**Andhra Pradesh and Telangana will share Hyderabad as a capital for ten years, after which Andhra Pradesh will have to move to a new administrative centre**

# **BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI**

**On India Independence Day in 2014. it was announced that the new capital will be located at Amaravati near Gunter and Vijayawada, two of the largest cities in Andhra Pradesh**

**Amaravati will be India's fifth planned city, but the first planned capital city to come up from scratch in decades.**

**Land for the capital will be acquired through a Land Pooling process and supplemented by land acquisition.**



# **BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI**

**On 08 December 2014, the governments of Singapore and Andhra Pradesh signed a Memorandum of Understanding to collaborate on the master planning and development of the new Andhra Pradesh Capital City.**

**Surbana Jurong Consultants Pte Ltd was appointed by the Singapore Government to undertake the master planning for the Andhra Pradesh Capital City Project.**

**In Andhra Pradesh, a new agency APCRDA - Andhra Pradesh Capital Region Development Authority, was established to take charge of the Project**

# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

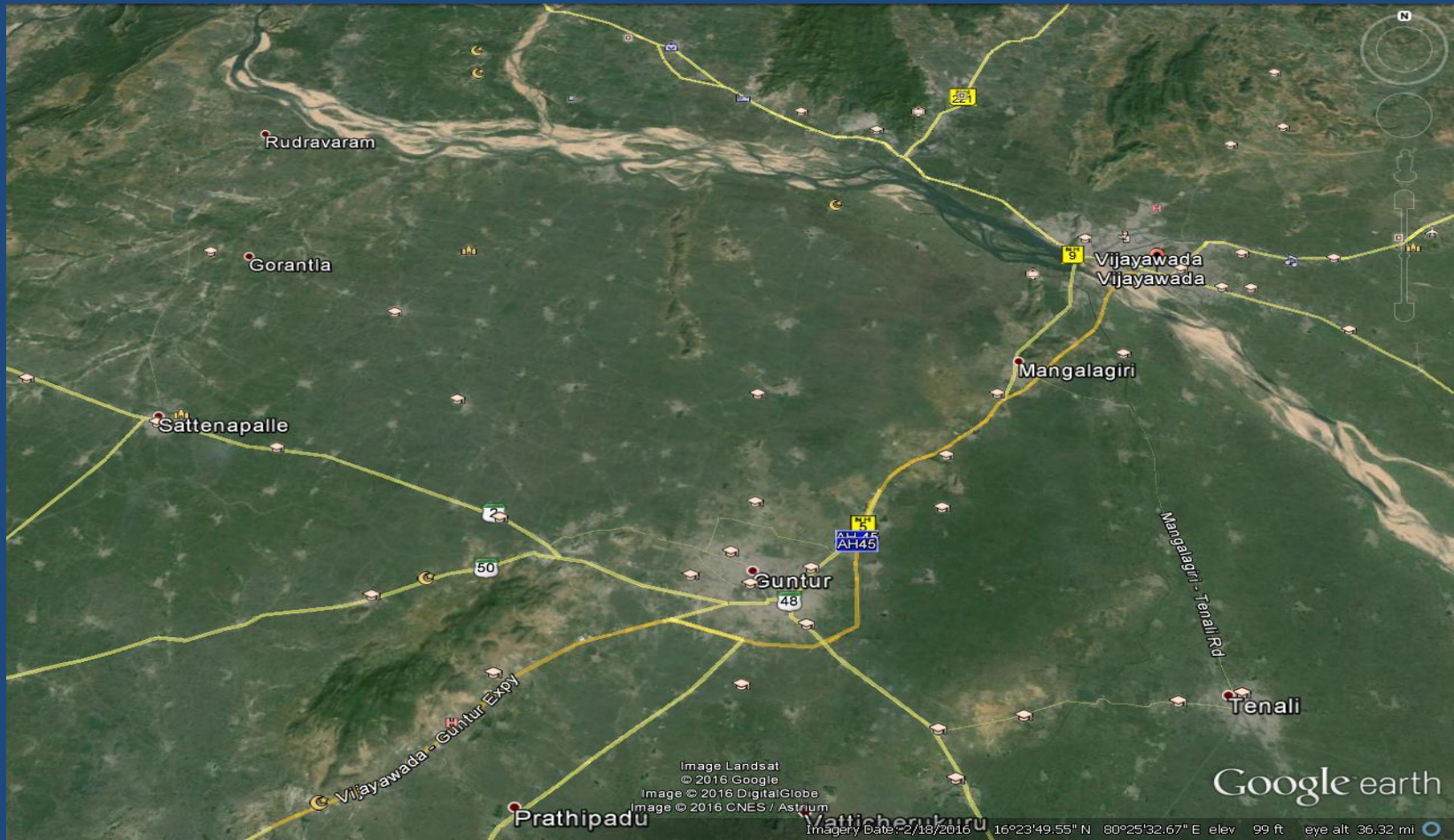
*The development of the New Capital City will be on a green field site of approximately 217 sq km located centrally within the Capital Region. The Capital Region comprises of 7,420 sq.km straddling on both sides of the Krishna River in both Krishna and Guntur Districts. The Capital Region is well connected to the surrounding economic hubs by air , rail, road, and ports.*

# **BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI**

## **MASTER PLANNING PROJECT – SCOPE OF WORKS**

- 1. CAPITAL REGION PLAN**
  - To set the planning direction and strategies for the Capital Region of Andhra Pradesh.
  
- 2. CAPITAL CITY MASTER PLAN**
  - To prepare a detailed Master plan for the new Capital City of Andhra Pradesh.
  
- 3. SEED DEVELOPMENT MASTER PLAN**
  - To prepare Urban Design and development control guidelines for the first section of the Capital City

# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



Google view of the designated site

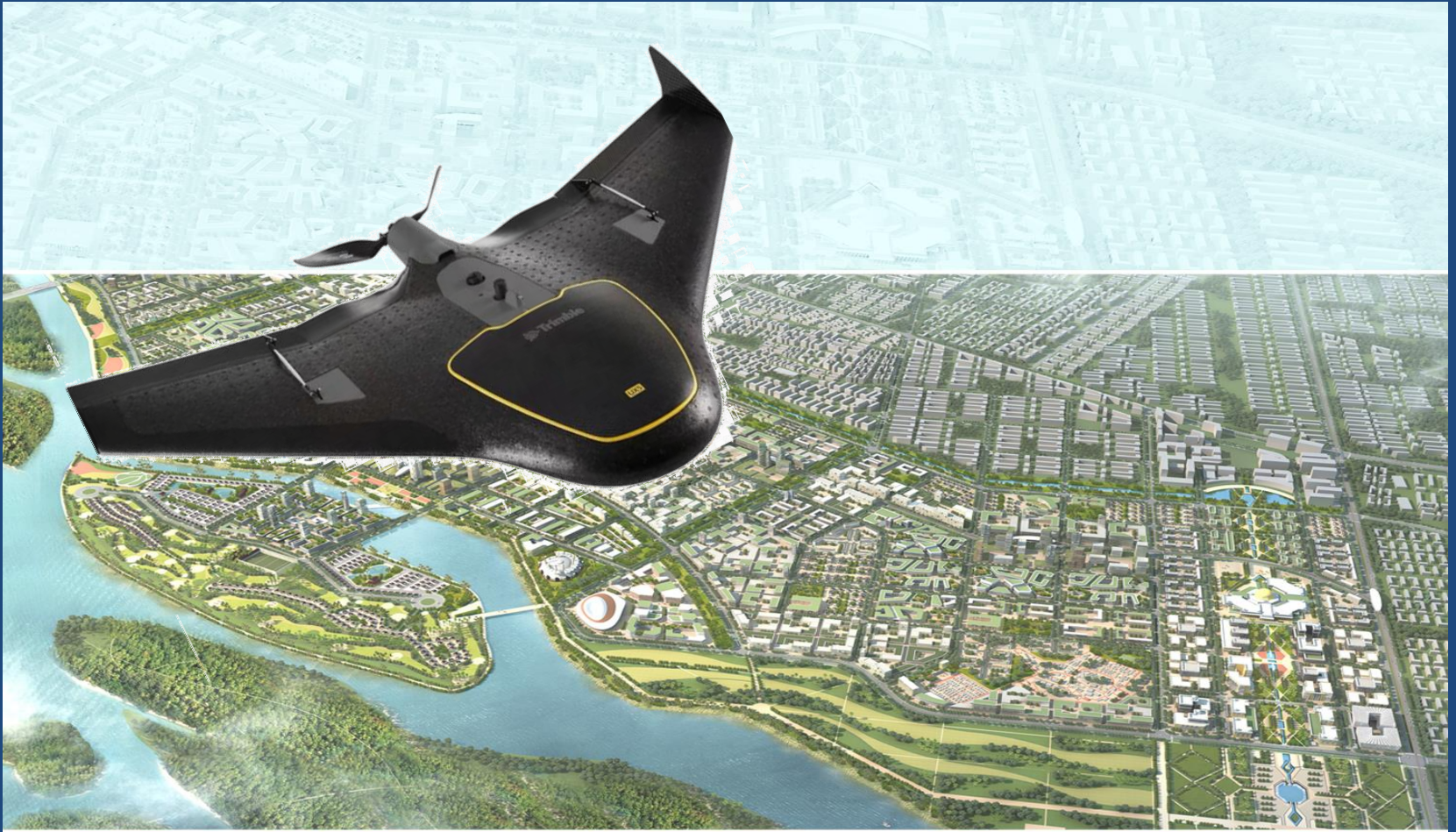
# **BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI**

**CAPITAL REGION PLAN WAS CONSTRUCTED BASED ON  
MAPS DERIVED SATELLITE IMAGERY**

**THE DETAILED CAPITAL CITY MASTER PLAN WAS  
DESIGNED BASED ON TOPOGRAPHICAL  
SURVEY CONDUCTED FOR THE 217 SQ KM SITE.  
UAV TECHNOLOGY WAS USED FOR THE  
TOPOGRAPHICAL SURVEY**



# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**





# **BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI**

## **DRONE SURVEY - PROJECT OVERVIEW**

1. Coverage area of Drone Survey is about 350 sq.km.
2. Survey area will be subdivided into 110 Blocks (Flight Strip)
3. Each block will cover an area of 3 to 5 sq.km
4. Flying height is at 383 m above ground level
5. Images are captured at 10 cm GSD (Ground Sampling Distance)
6. Flying is estimated to complete in 2 weeks time (depending on weather condition)
7. Data Processing is estimated to complete in 2 weeks time.

# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

## **DRONE SURVEY – KEY MILESTONES**

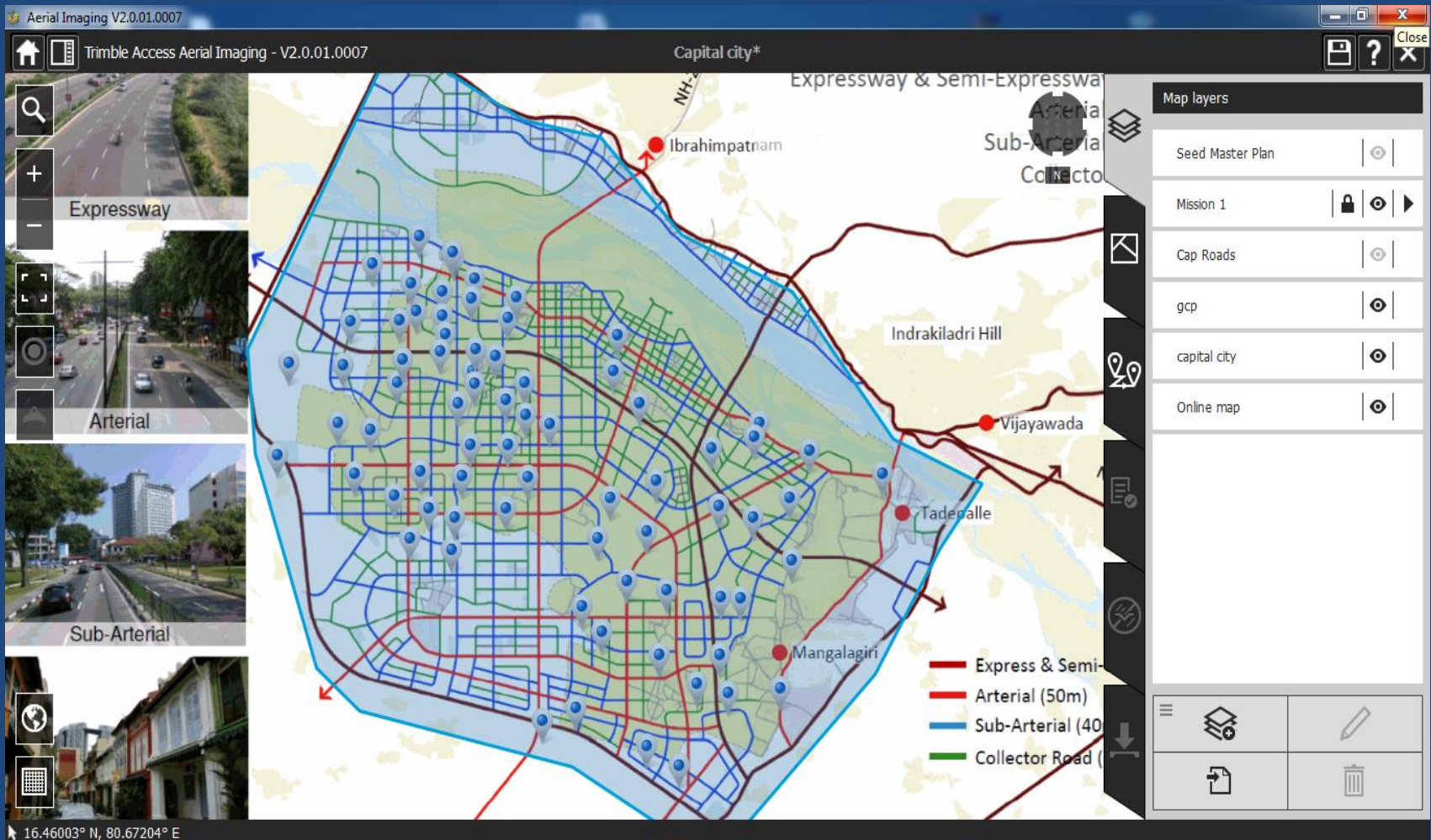
1. Reconnaissance Survey of the Site for flight planning
2. Identification/Establishment of Ground Control Points in the Survey Area
3. Flying – Aerial Survey
4. Post Processing – Downloading data and processing
5. Data submission

# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

## **DRONE SURVEY – DELIVERABLES**

1. Aerial photo blocks of the 350 sq km site
2. 10 GSD resolution orthomosaic the Capital Area
3. High resolution raster digital elevation model and contours
4. Point cloud data

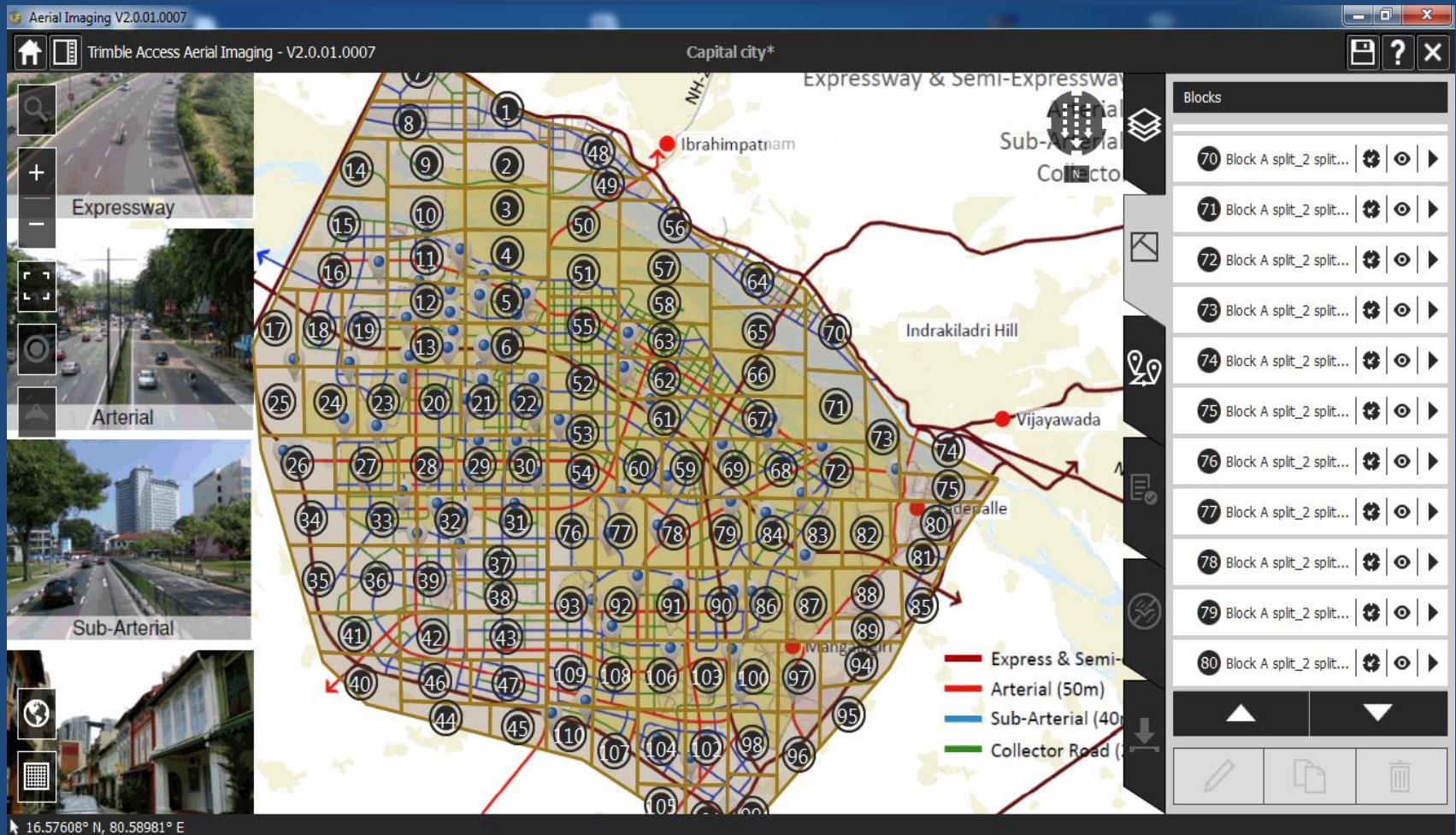
# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



Mission Area Boundaries and GCP's

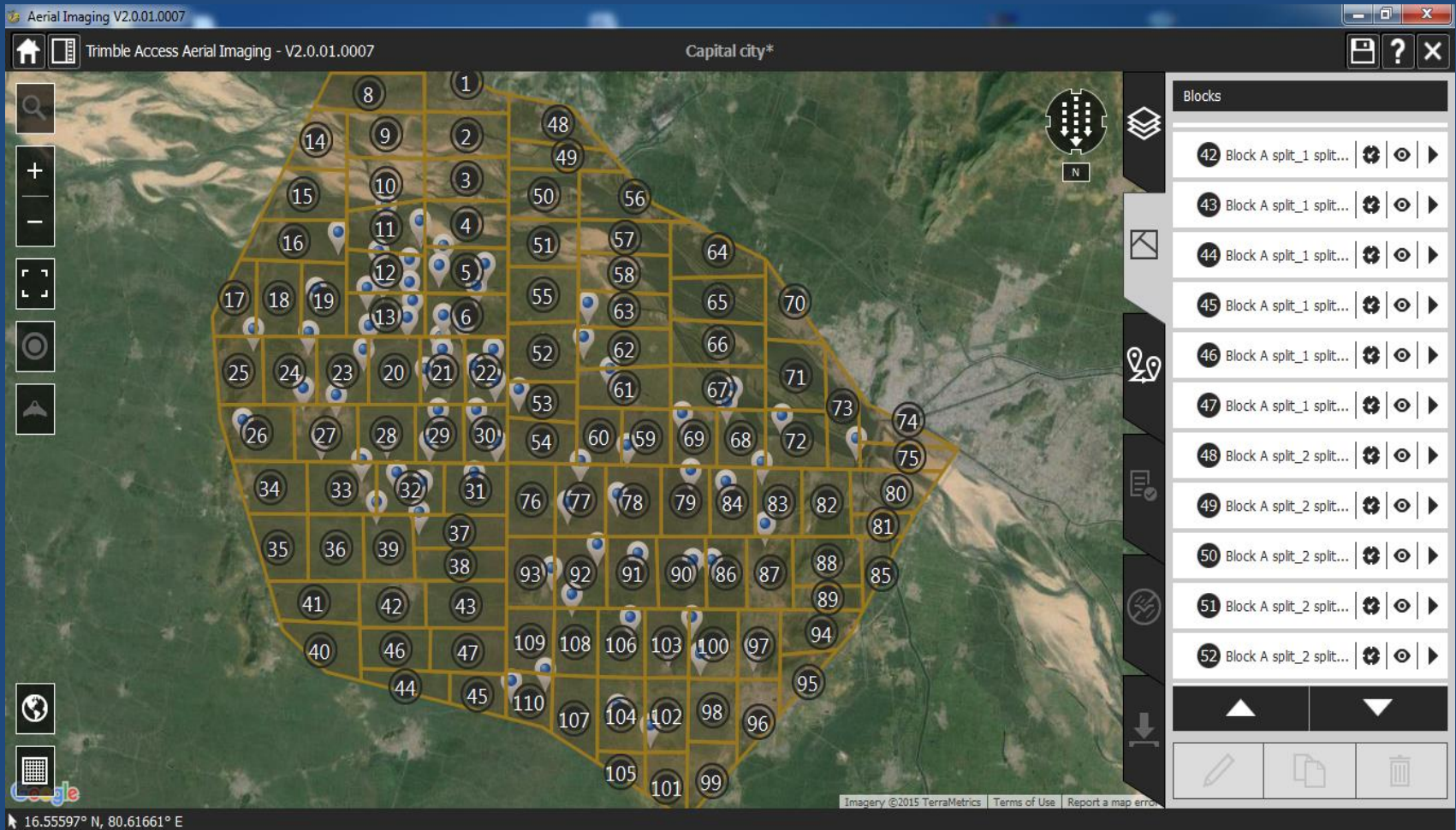


# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



Flight Blocks with GCPs

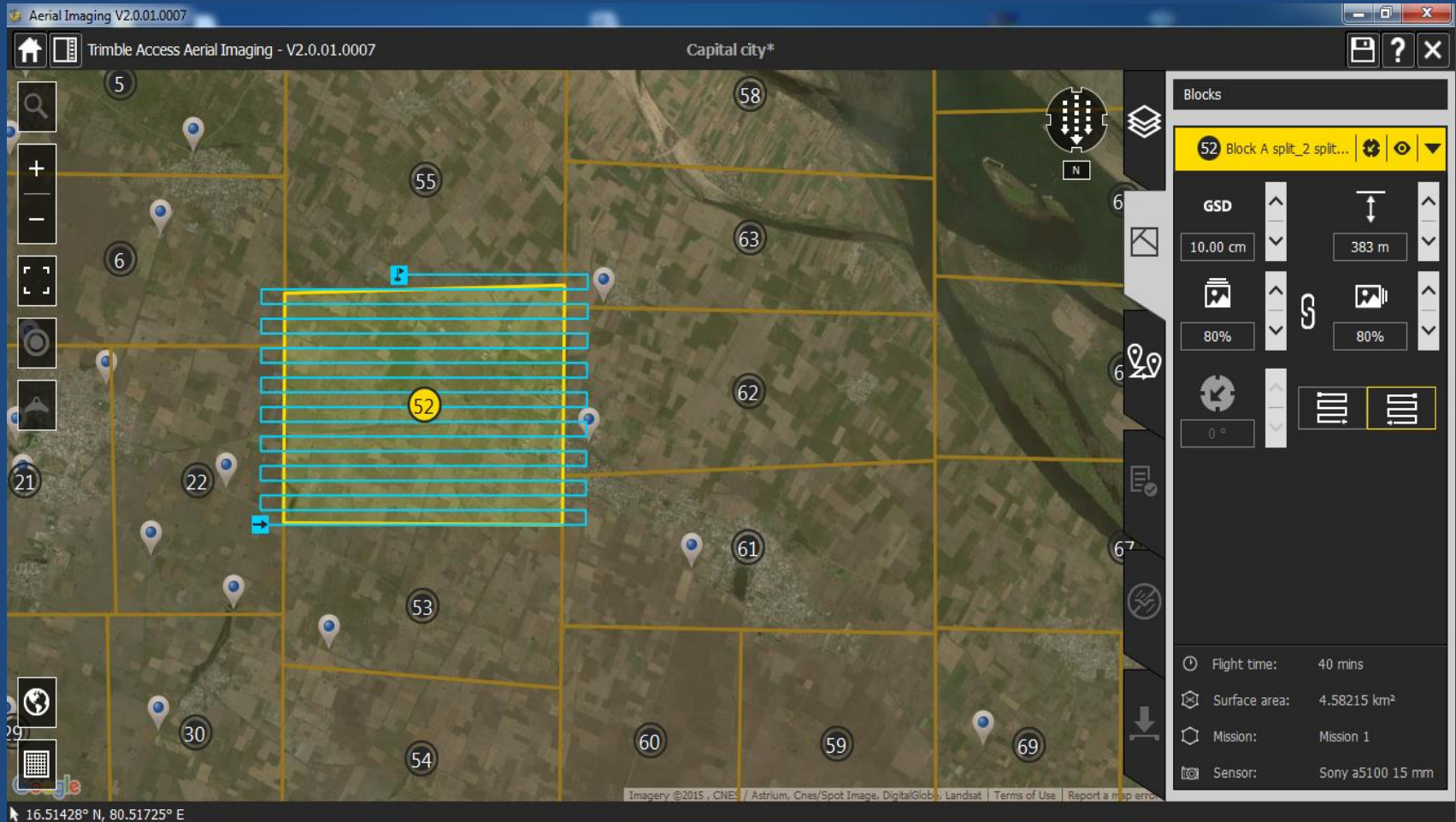
# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



Flight Blocks overlay on Satellite Map



# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



Flight Blocks Details with Flight Lines

# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

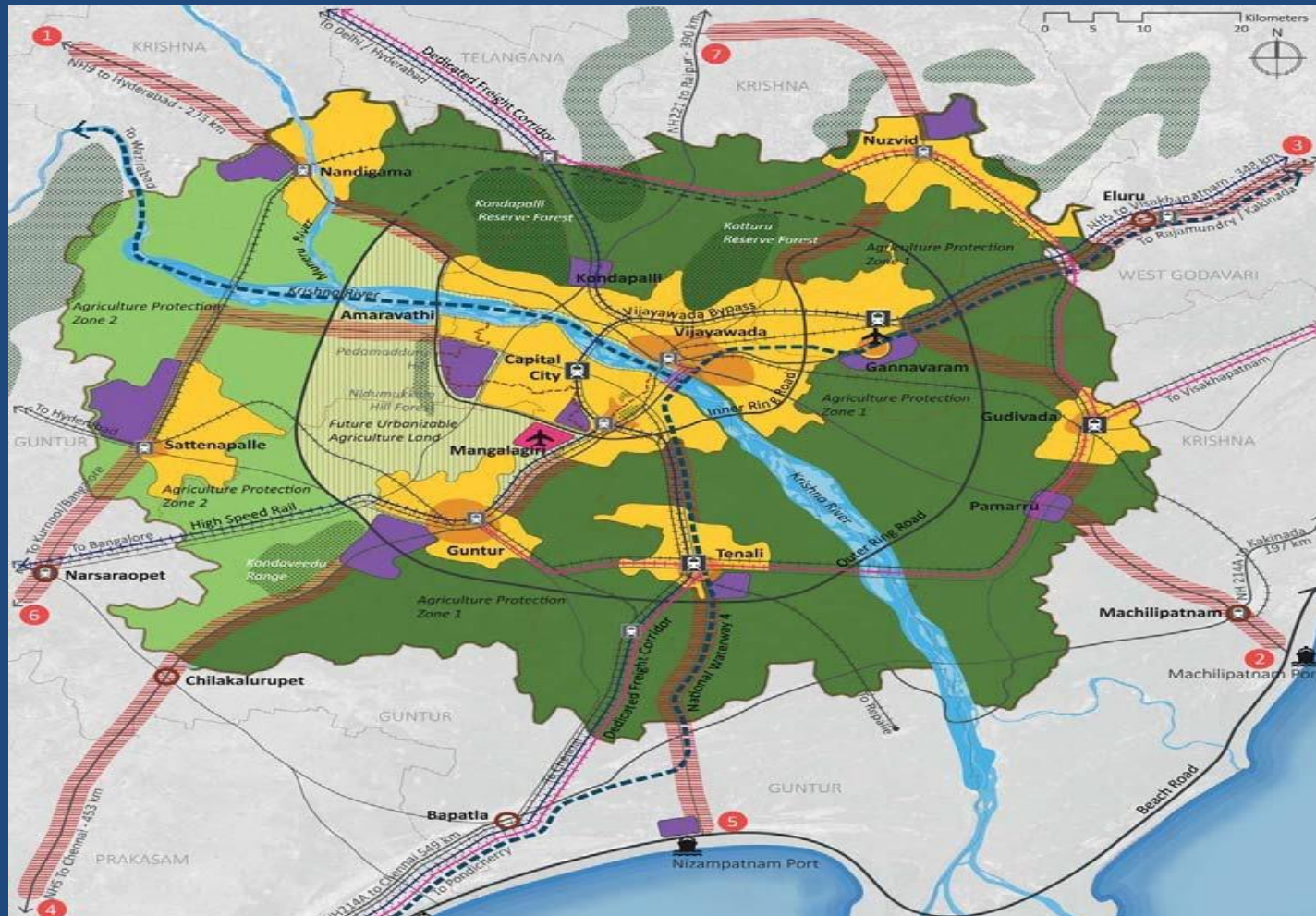
## **DRONE SURVEY - GROUND CONTROL POINT MARKERS (GCP)**

GCP target marker has to be put on with the size of 2 x 2 M





# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



CENTRAL REGION PLAN

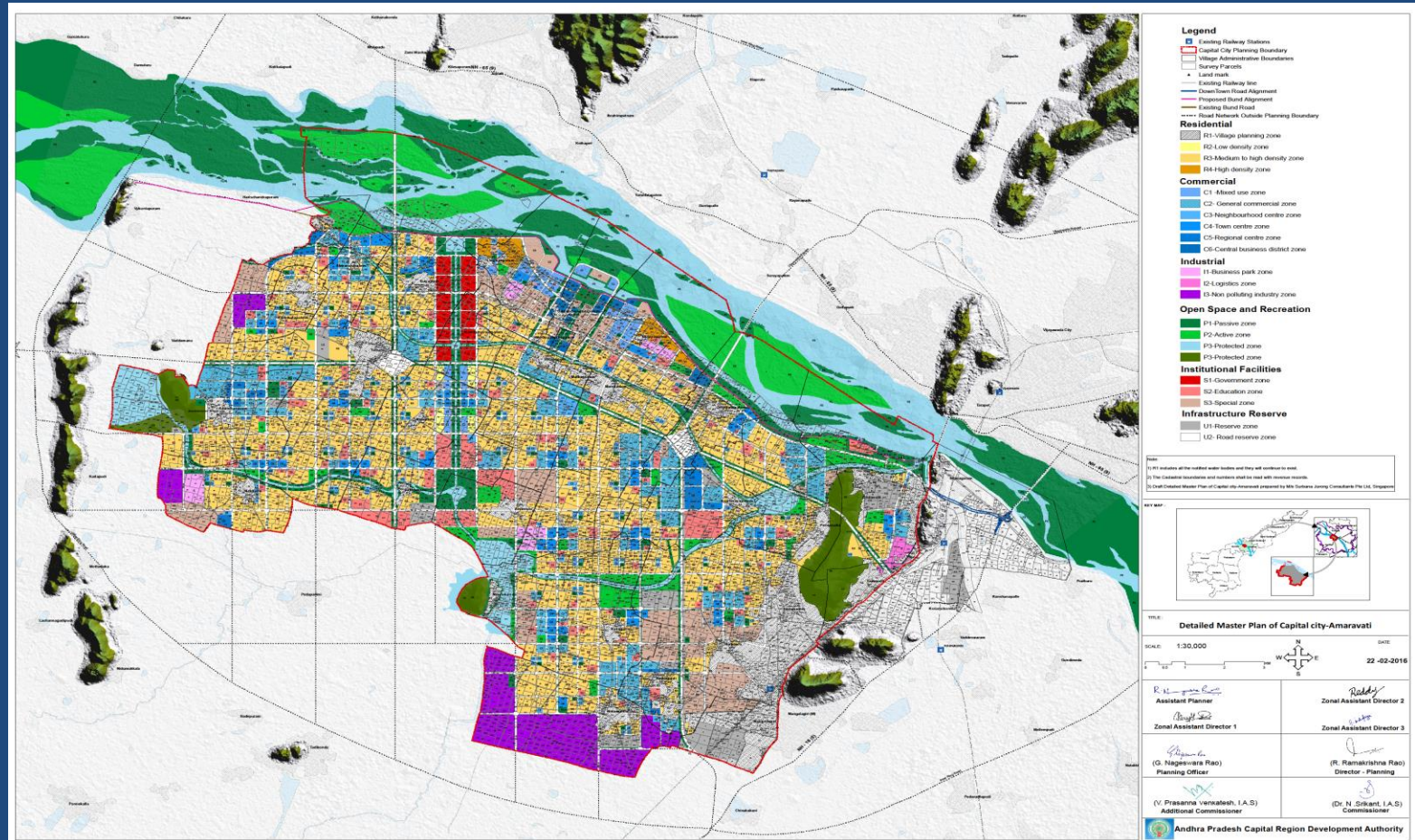
# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



CENTRAL REGION PLAN



# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI







# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

*The Capital Region Plan was completed on 30 March 2015.*

*The Capital City Master Plan and Seed Development Master Plan were handed over to APCRDA on 20 July 2015*

# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**





# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



FOUNDATION STONE FOR THE NEW CAPITAL



# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



TeluguPeople

EXCLUSIVE

SJ

# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**





# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



Along the bank of Krishnan River

# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



Landmark for the new capital - AMARAVATHI

# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**





# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**





# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**





# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**





# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**





# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**





# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**





# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



***FUTURE CITY OF AMARAVATI***



# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



***FUTURE CITY OF AMARAVATI***

# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

The new city will be built at an expected cost of 1 trillion rupees (£10.7bn) and is expected to generate jobs to sustain a population of 9-12 million people in the surrounding capital region.



# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

Upon Completion of the Master Planning Project, Surbana Jurong also secured the **'Consulting Services for Preparation of Land Pooling schemes for Amaravati (Capital City) Area of APCRDA'** through a competitive tender.

# **BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI**

**Terms of Reference for the 'Consulting Services for Preparation of Land Pooling schemes for Amaravati (Capital City) Area of APCRDA' are:**

- 1. Demarcate the entire road network for the Capital City area.**
- 2. Demarcate all the new land parcels created for the entire Capital City.**
- 3. Implement the land lot numbering system**
- 4. Create Cadastre GIS**
  - To facilitate easy urban planning, development control, land use and land management**

# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

## **‘Land Pooling Scheme’ –**

assembly of small land parcels under different ownerships voluntarily into a large land parcel;  
provide the enlarged land parcel with infrastructure in a planned manner and return the reconstituted land to the owners, after deducting the land required for public open spaces such as parks and play grounds, social housing for economically weaker sections, social amenities such as school, dispensary and other civic amenities, road network, and other infrastructure as specified under the Act as well as such extent of land in lieu of the cost of development towards the provision of infrastructure and amenities and other costs and expenses to be incurred for the scheme and external trunk infrastructure;



# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

## **‘Land Pooling Scheme’ –**

Land Pooling process is not new to India.

It had been implemented in other Indian state, like Gujarat.

However, the land pooling exercise in Amaravati is the largest such exercise India has seen.

against angry farmers, disappearing land records and ancient architectural beliefs. Despite these hurdles, is Amaravati still on track?

# **BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI**

## **PROBLEMS ENCOUNTERED BY PLANNERS & SURVEYORS**

- 1. ANCIENT ARCHITECTURAL BELIEFS**
- 2. DISAPPEARING LAND RECORDS**
- 3. ANGRY FARMERS**

# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

## ANCIENT ARCHITECTURAL BELIEFS

The traditional Hindu system of *Vaasthu Shastra* , *dating back from the 6<sup>th</sup> century* belief the alignment of buildings can bring about bad or good luck

The people of Andhra Pradesh have a deep-rooted belief and will not buy any property that is not north- or east-facing.

The draft plan had to be send back to the master planners for amendment taking these principles into account. The whole capital city project would have had no buyers if the initial draft had been implemented



# **BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI**

## **DISAPPEARING LAND RECORDS**

The Capital City covers an area of 35,000 acres. Land records of the affected land parcels have to be verified for the purpose of acquisition and compensation.

More than 100 government surveyors were dispatched to physically verify and record land ownership details. They were stumped by the humongous task.

# **BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI**

## **DISAPPEARING LAND RECORDS**

In many cases, land records had not been updated for 90 years. There were survey records dating back to the British era, but none of the new survey numbers were recorded. For instance, in 1908, there was a record of 9.5 acres of land belonging to one person. When physically verified the same plot of land, is now owned by 12 people – and there is no records of them at all.

Thus began a Herculean task of updating land records over 35,000 acres of land. Until and unless these details were finalised, land pooling and actual building of the new capital could not begin.

# **BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI**

## **ANGRY FARMERS DISPUTES OVER LAND BOUNDARIES**

Updating of land records also created a large number of settlement disputes,  
From the old land records, land boundaries were identified using vague markers such as 'a tamarind tree in the south-west corner of the plot'.  
Once the tamarind tree is cut down, you have no idea where the land boundary is.



# BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

## FARMERS DISPUTES OVER COMPENSATIONS

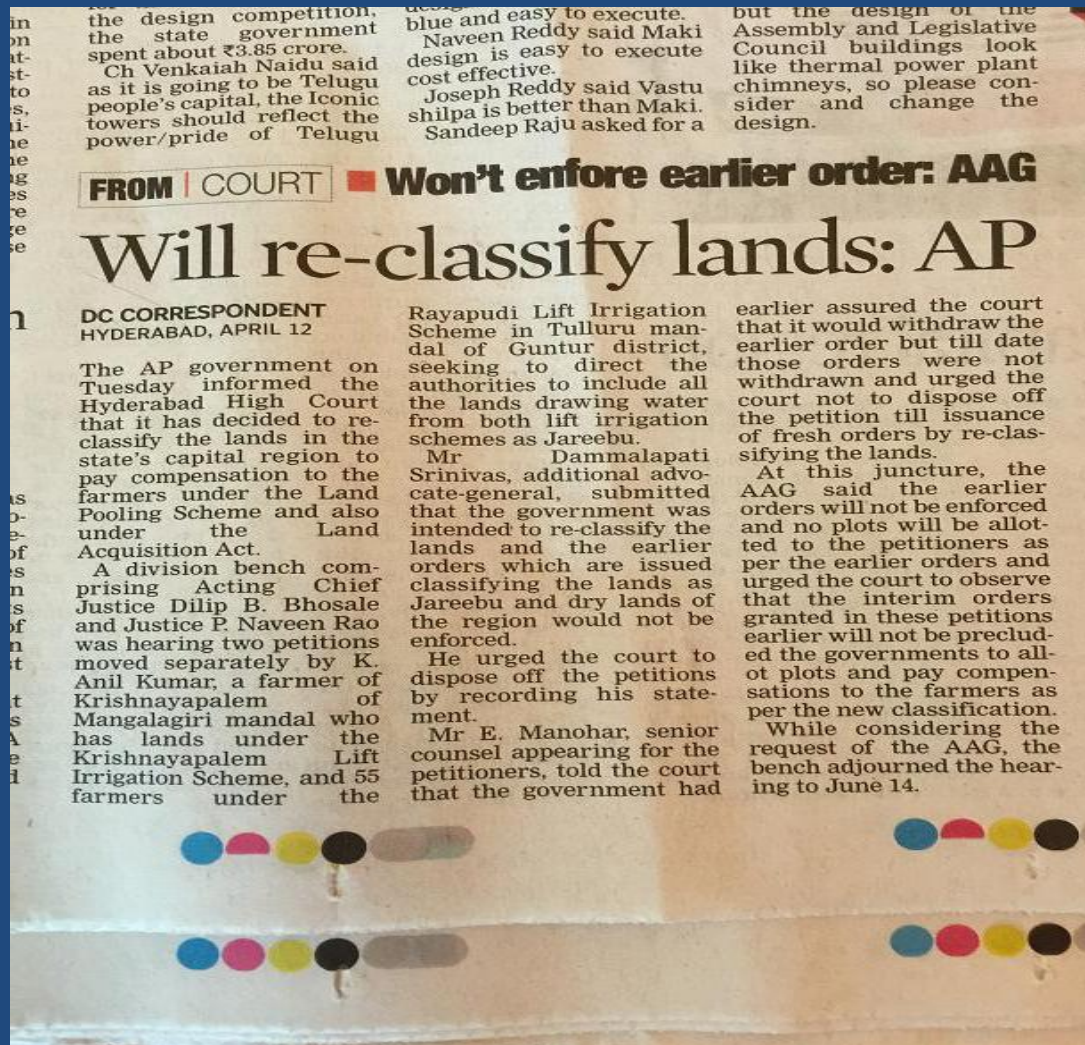
To date, the state government has successfully managed to pool together 33,000 of the required 35,000 acres of land for the new capital. Difficulties remain, with farmers in more urban and fertile areas refusing to pool their land as the compensation offered by government is regarded as much less than the prevailing land value.

Many affected owners have petitioned the High Court in Hyderabad for more equitable compensation.

# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



Land owners  
bring AP  
government to  
Court over  
classification of  
lands and  
compensations



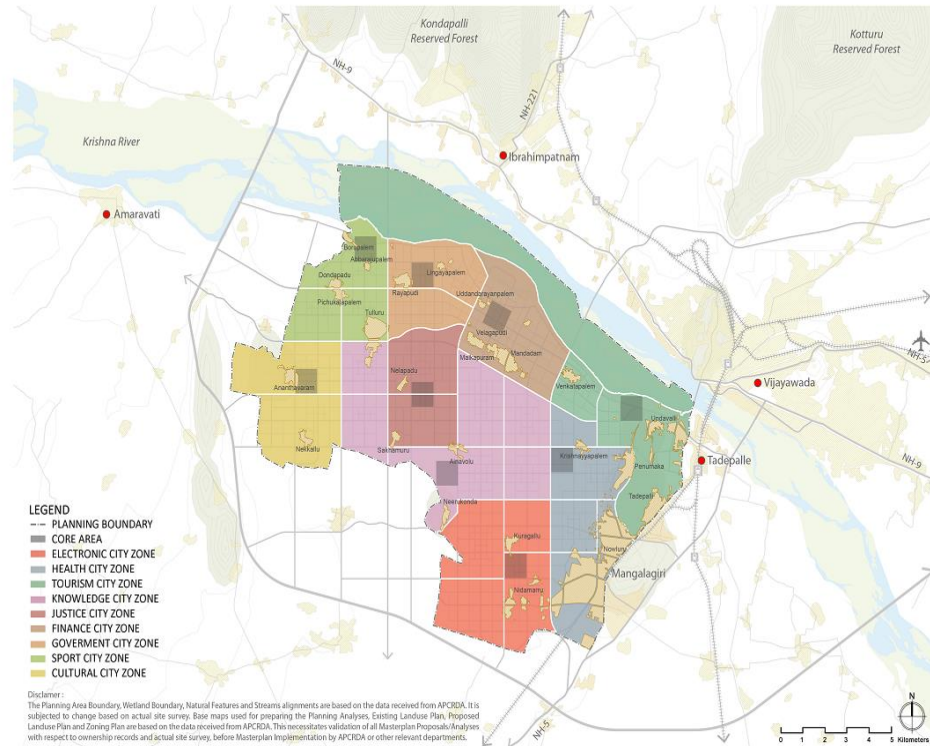
# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



Farmers protesting outside APCRDA Office in Vijayawada

# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

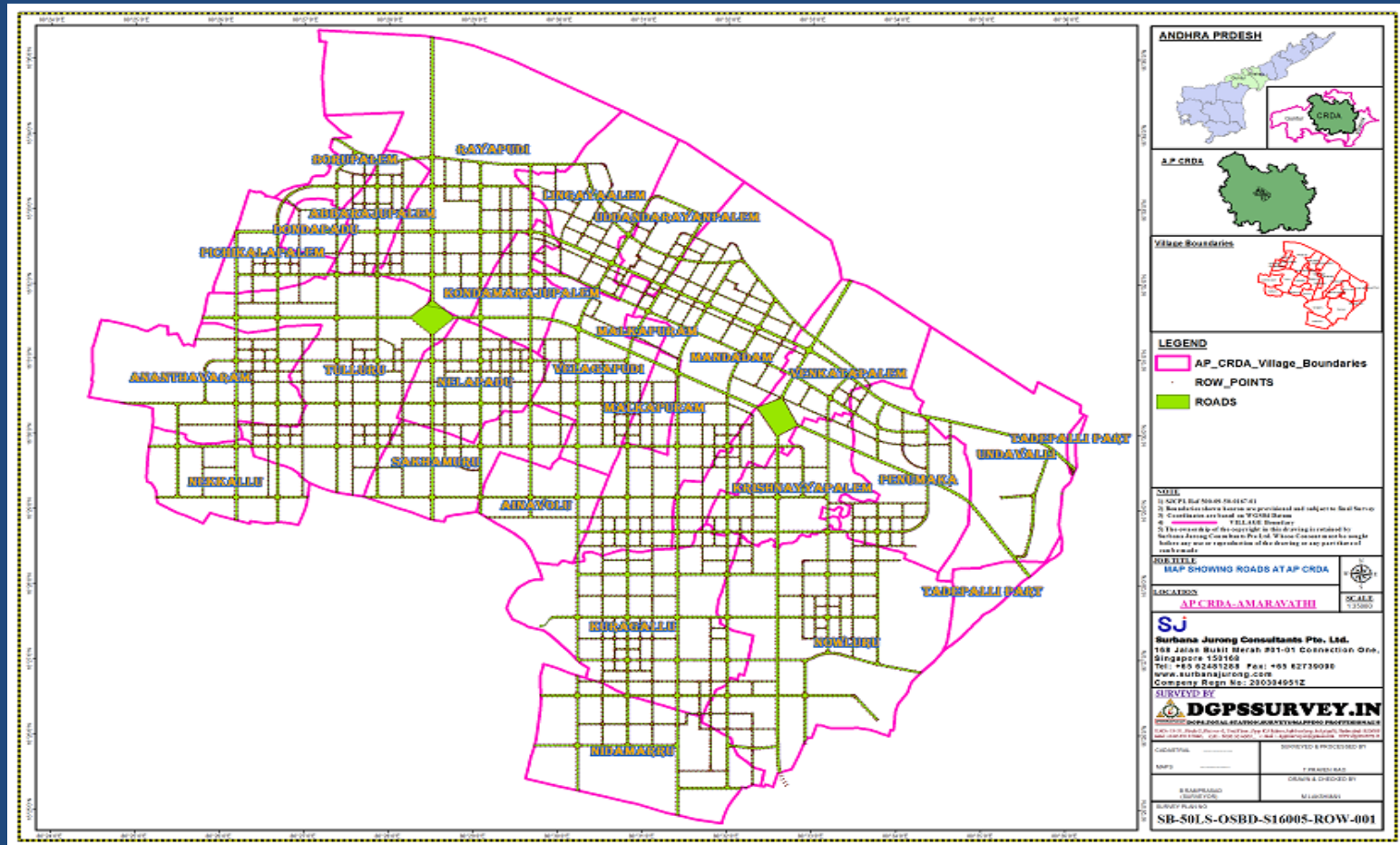
FOR EFFICIENT  
MANAGEMENT  
OF SURVEY  
WORKS THE  
CAPITAL CITY IS  
SUBDIVIDED  
INTO 29  
DISTRICTS, EACH  
NAMED BY THE  
VILLAGE IT  
ENCOMPASSED



Capital City Nine Cities Boundary Plan

THE NEW CAPITAL CITY OF ANDHRA PRADESH | CAPITAL CITY MASTERPLAN REPORT - PART 2

# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

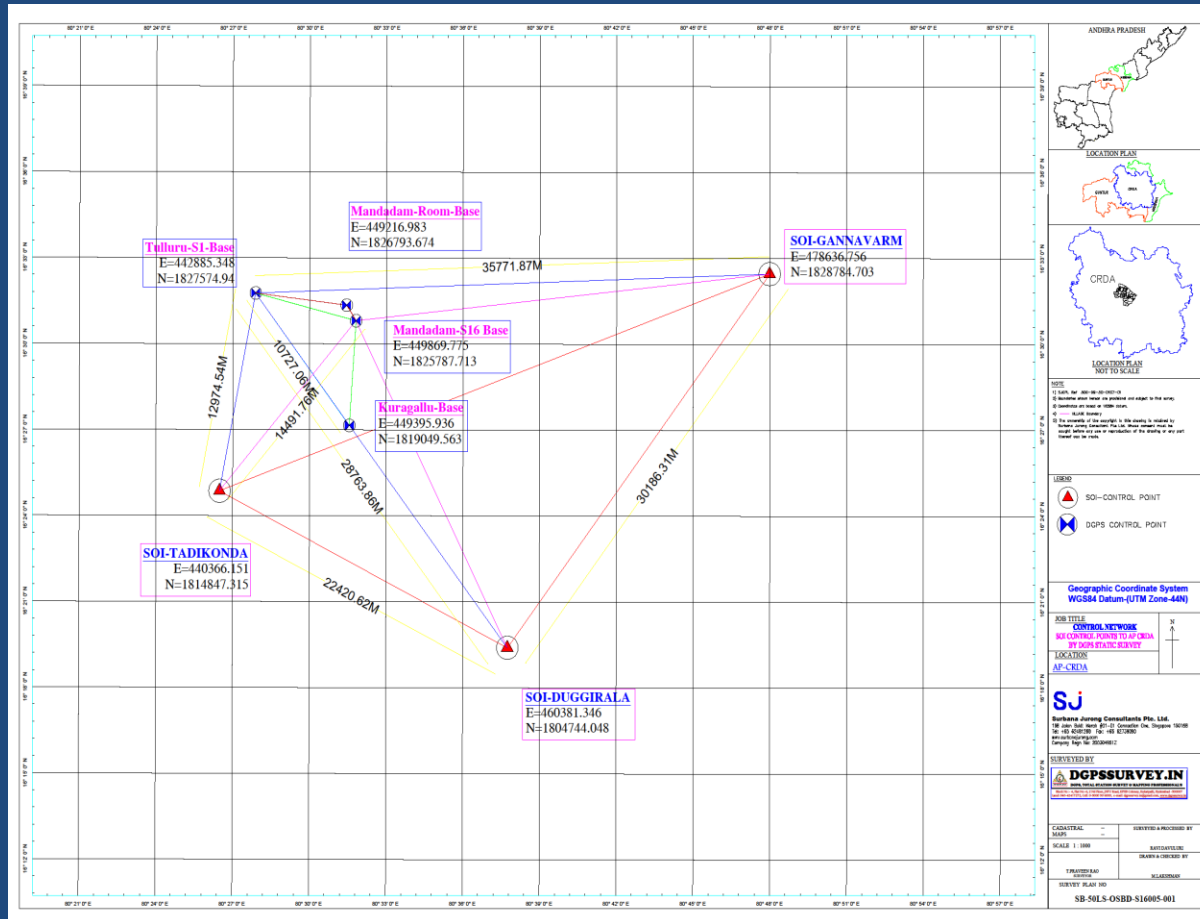


BOUNDARY OF THE 29 VILLAGES



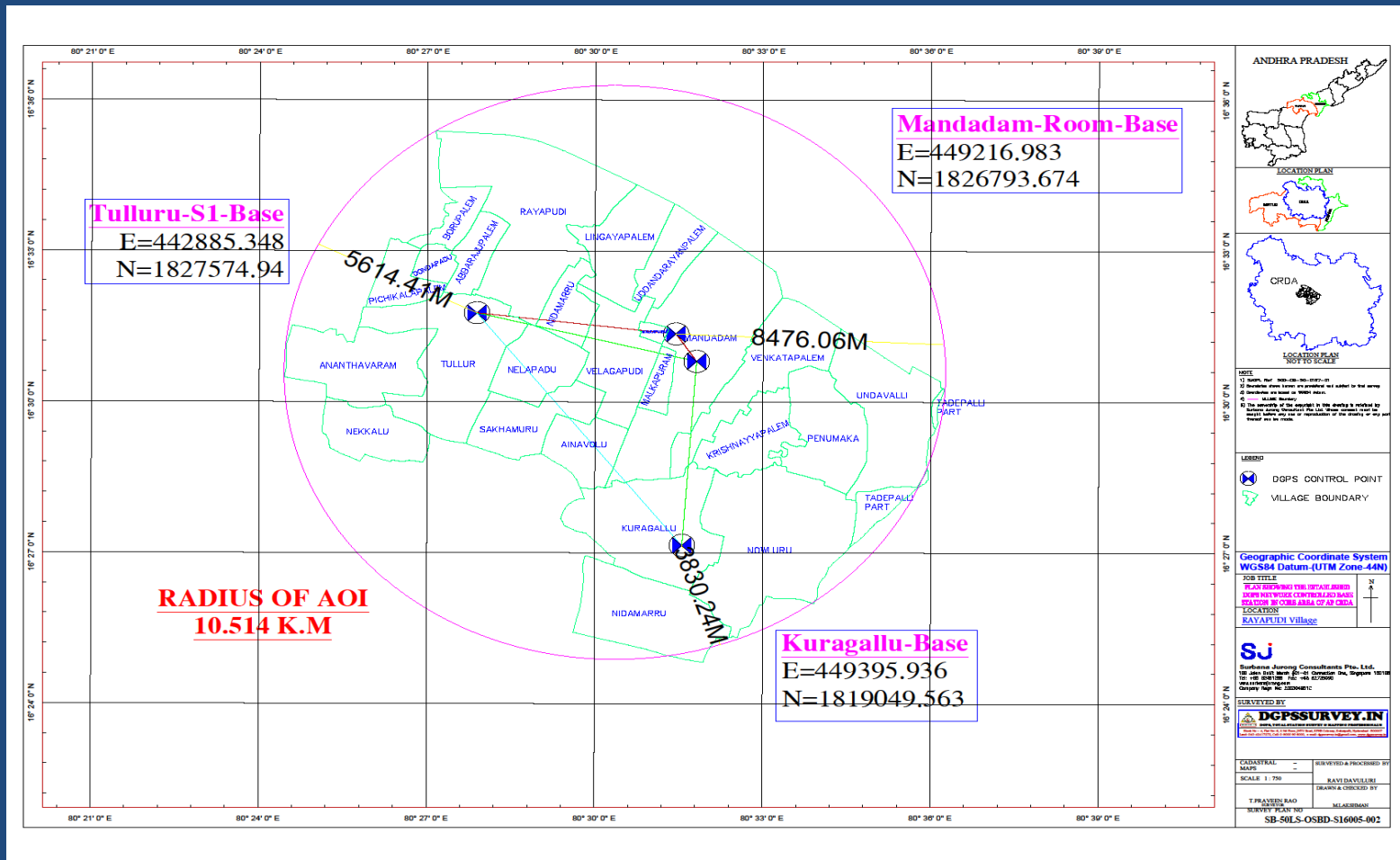
# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

ROW (RIGHT OF WAY SURVEY) – DEMARCATION OF ROAD NETWORKS



**DATUM FOR  
SURVEY IS  
FROM  
HORIZONTAL  
SURVEY  
CONTROL  
MARKERS  
ESTABLISHED  
BY SURVEY OF  
INDIA (SOI)**

# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



**ADDITIONAL HORIZONTAL SURVEY CONTROL MARKERS  
ESTABLISHED TO FACILITATE RTK SURVEY**

# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



**SOI Control Station at  
GANNAVARAM**





# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



**SOI Control Station at DUGGIRALA**

# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



**PROJECT Control Station  
at KRISHNAYAPALEM**



**PROJECT Control Station  
at KURRAGALU**



# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



**PROJECT Control Station  
at MANDADAM**



**PROJECT Control Station  
at TULLUR**



# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



**PROJECT Control Station  
at MANDADAM ROOM**

# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



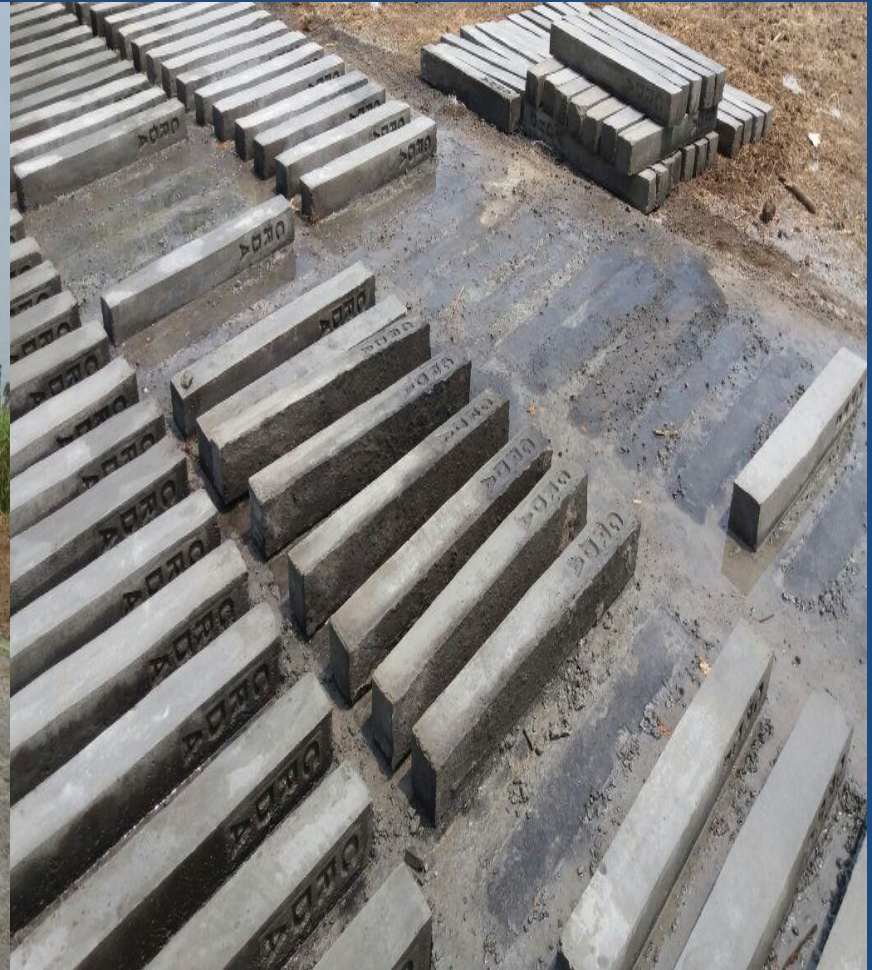
**PROJECT Control Station  
at KRISHNAYAPALEM**



**PROJECT Control Station  
at KURRAGALU**



# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



ON SITE CASTING OF CONCRETE MARKERS



# LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATHI



CONCRETE MARKERS FOR  
ROW



CONCRETE MARKERS FOR  
LAND PARCELS

# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



5 Survey Teams were deployed for the ROW Survey



# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



MEETING SURVEY TEAM ON SITE



# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



**INSPECTING SURVEY BASE STATION**

# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



PROJECT PROGRESS MEETING CONDUCTED AT SITE OFFICE

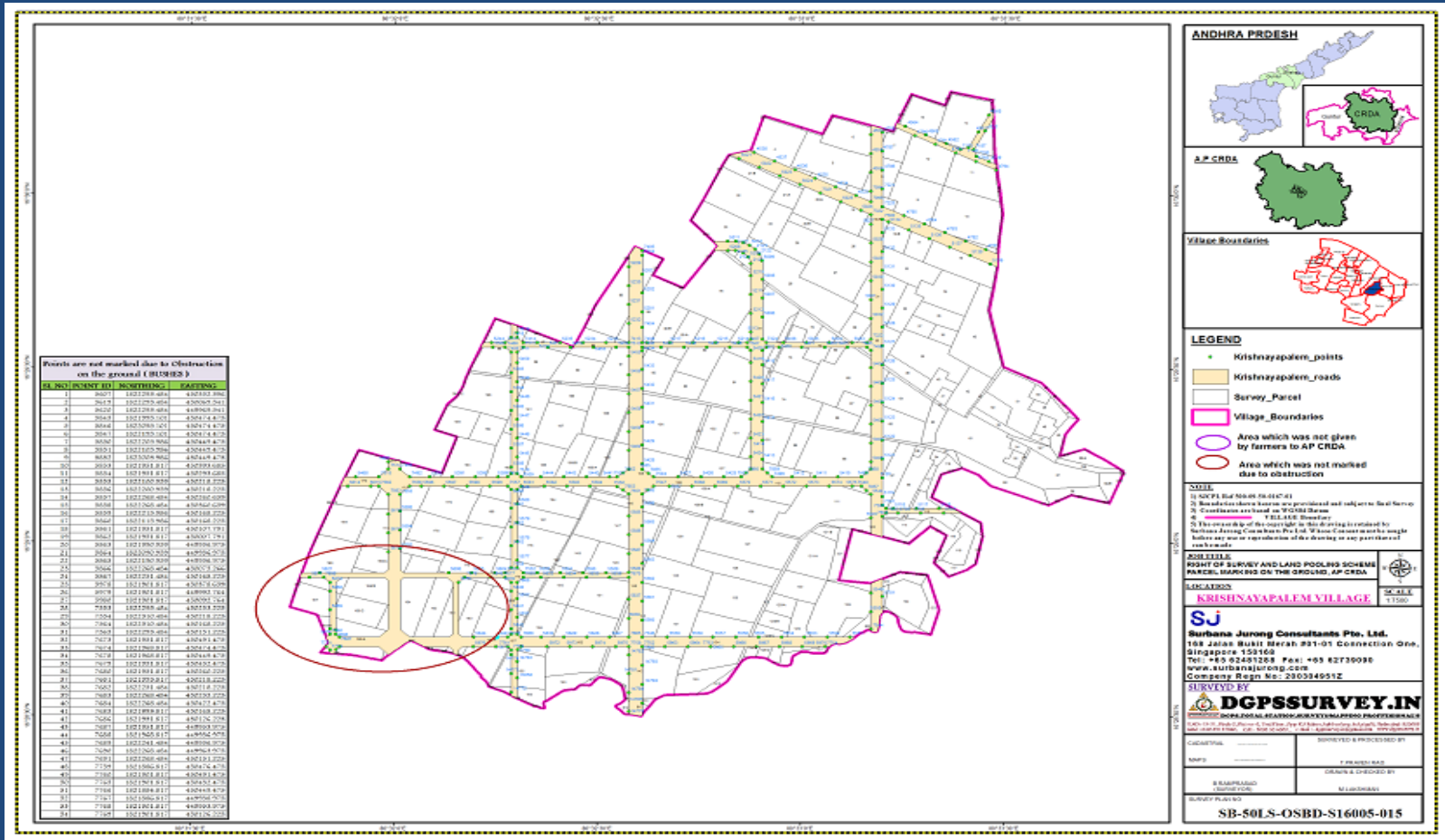
# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



MEETING WITH  
SRIKANT NAGULAPALLI  
IAS, COMMISSIONER,  
APCRDA

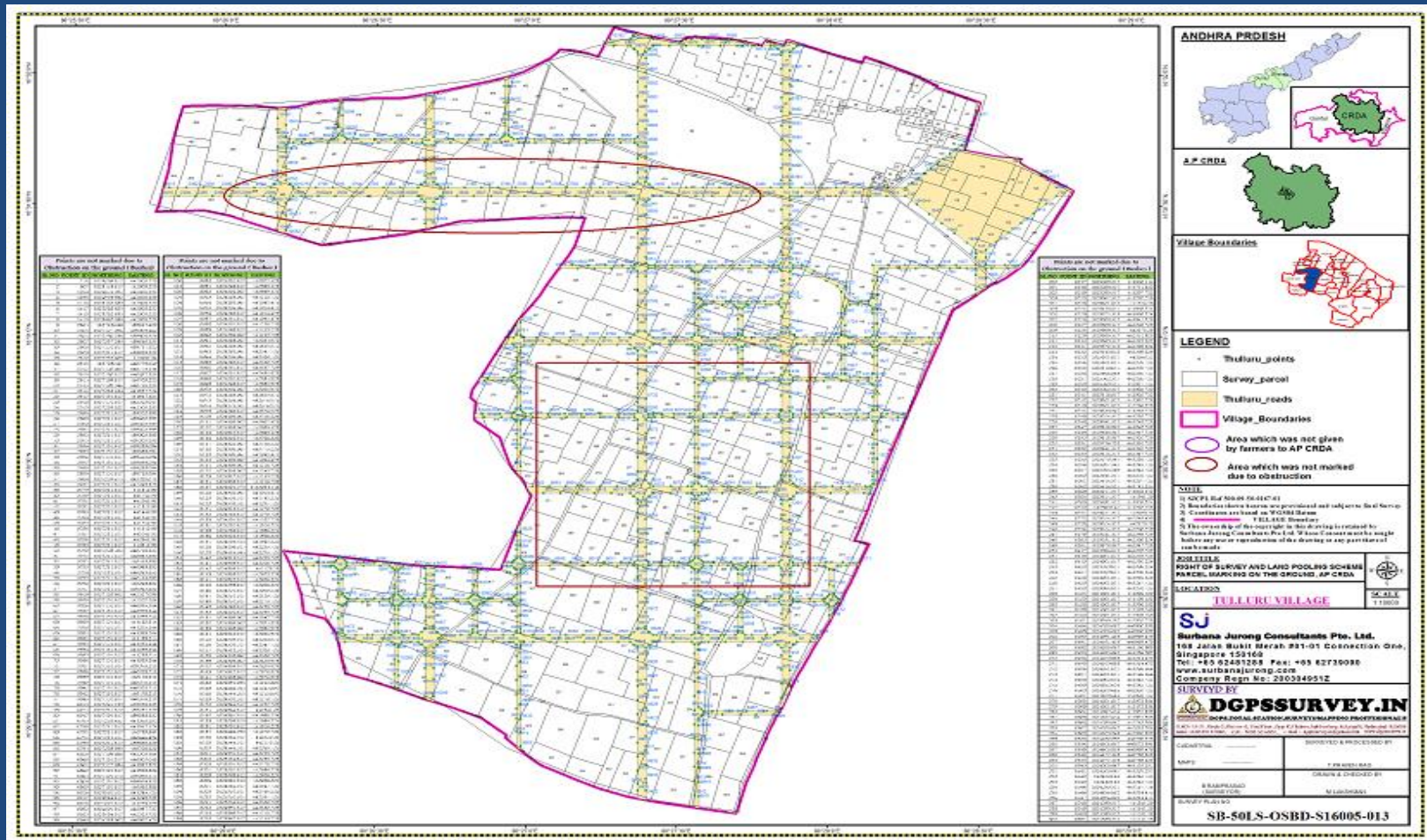


# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



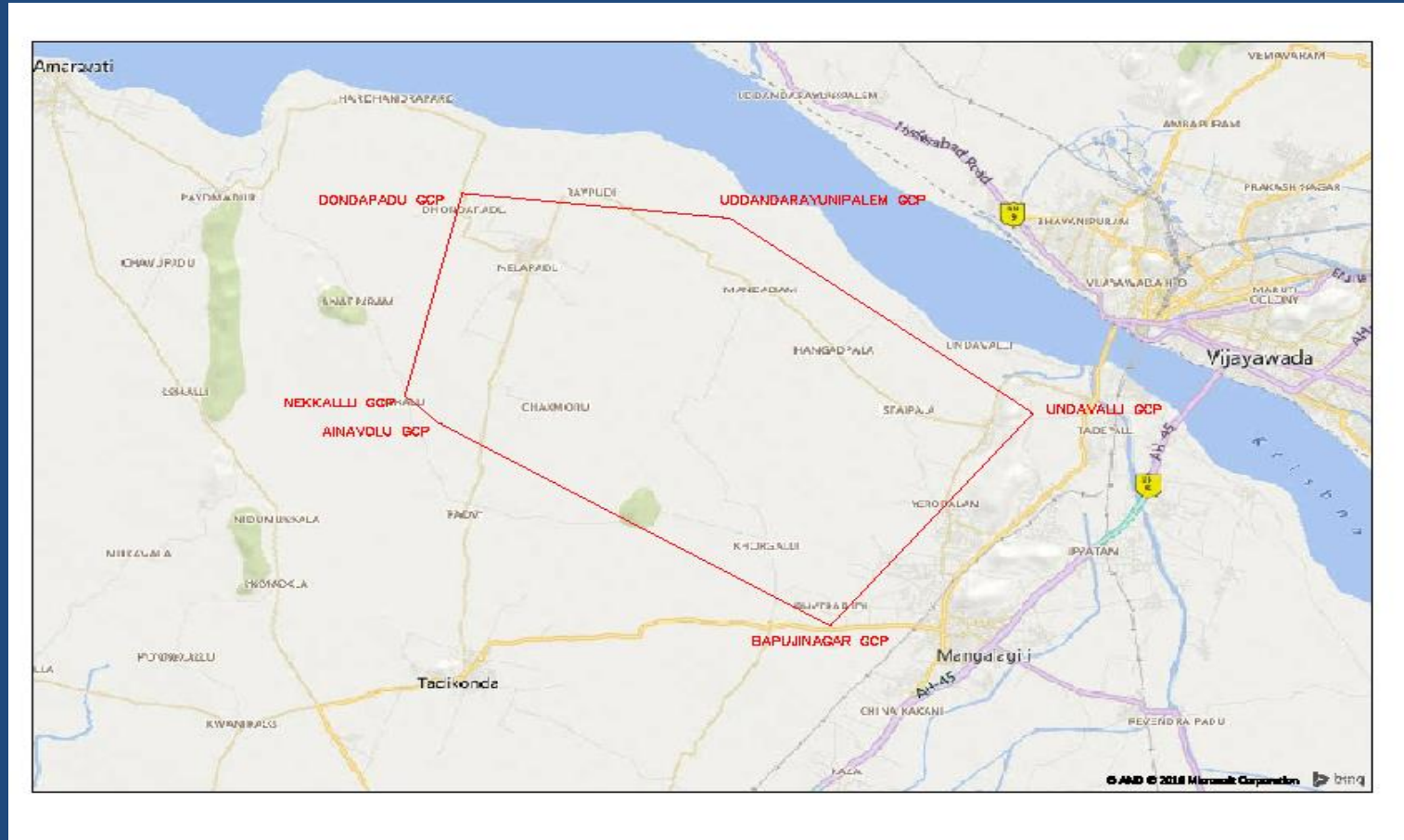
## DEMARCATED ROW AT KRISHNAVAPALEM VILLAGE

# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



DEMARCATED ROW AT TULLURU VILLAGE

# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



JUNE 2016 – ADDITIONAL CONTROL POINTS PROVIDED BY SOI



# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



**JULY 2016 – FINAL DEMARCATION OF ROWS AND LAND PLOTS**



# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



JULY 2016 – FINAL DEMARCATION OF ROWS AND LAND PLOTS

# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



SEPTEMBER 2016 – QC CHECK ON PLANTED BDY MARKS



# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



**JULY 2017 – MEETING APCRDA SURVEYORS IN SITE OFFICE**



# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



JULY 2017 – SITE INSPECTION



# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



JULY 2017 – PLANTING CONCRETE MARK



# PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

*Thank You*

**SEE SENG GUAN**  
**SENIOR CONSULTANT, LAND SURVEY**  
**SURBANA JURONG CONSULTANTS PTE. LTD**