

PROJECT:  
GPS GUIDANCE  
AUGMENTATION  
SYSTEM FOR LOW  
DENSITY COLOMBIAN  
AIRPORTS

# BACKGROUND



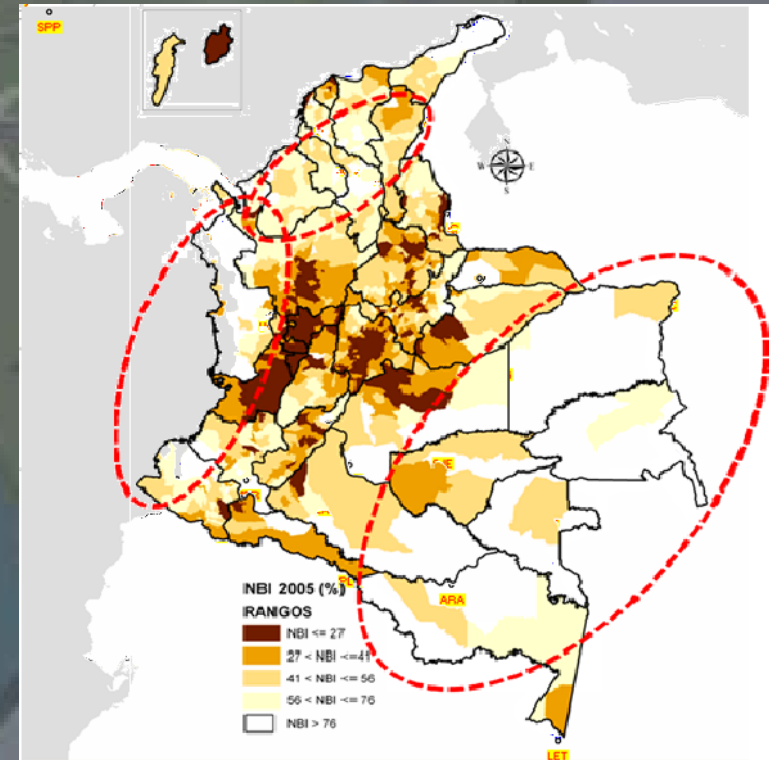
PNA COL: *Air navigation Plan for Colombia*

GEORED (50 stations)

PNNS: National Satellite Navigation Plan

# ISSUES

Remote airports in the jungle  
Unique mean to access those regions  
Few or non nav aids for approach and landing in domestic airports  
No coverage in lower airspace





# CURRENT SITUATION

## Global

IGWG, International GBAS Working Group.

CAT II y CAT III under analysis

GBAS CAT I available certified by FAA (waivers)

## Region

Brasil – FAA plans HONEYWELL CAT I in **Galeão** and **Santos Dumont** (2011).

Chile - FAA analysis GBAS on 12 airports. CAT I HONEYWELL in **Santiago** (2012).

Argentine – INVAP/Argentine Air Force / La Plata National University (2011)

# STRENGTH IN COLOMBIA



Colombian National University UNAL - AA+ Duff & Phelps.

187 Agreements with international universities

Math models

Software development

Materials test.



# GENERAL GOAL

Modeling, evaluation and simulation a technological solution for  
GPS GUIDANCE AUGMENTATION SYSTEM  
BASED ON GEODETIC REFERENCE NETWORK

”



# PROJECT TOOLS

Annex 10 ICAO

RTCA

ASTM

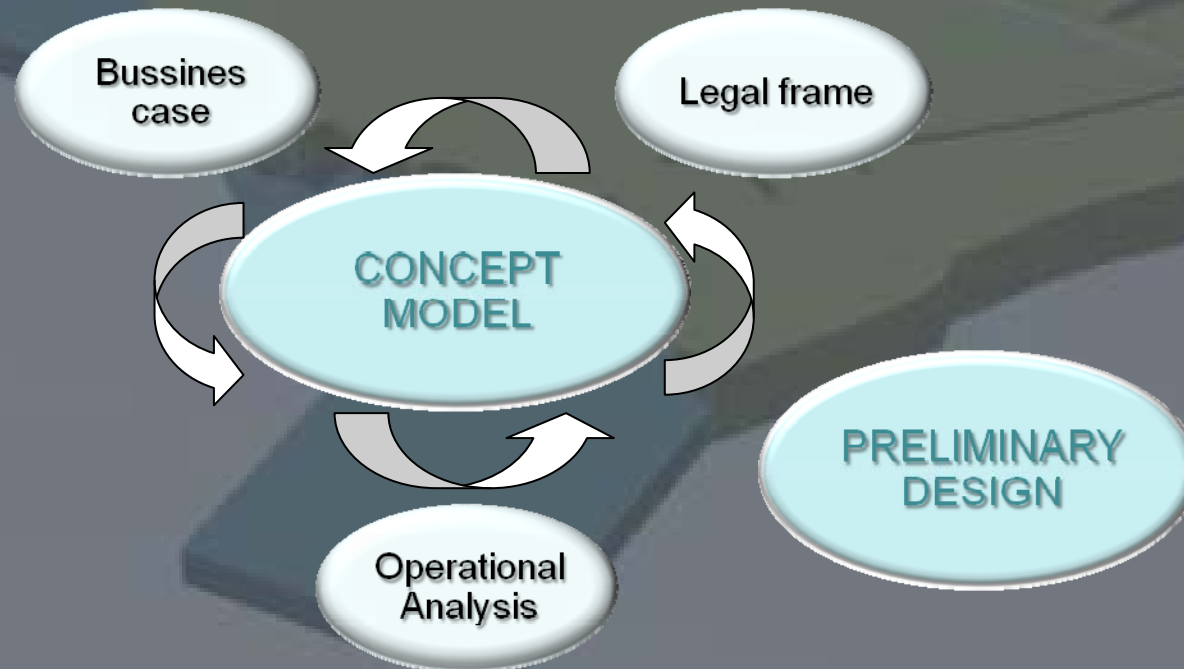
FAA ACs

EUROCONTROL Docs

International Agreements

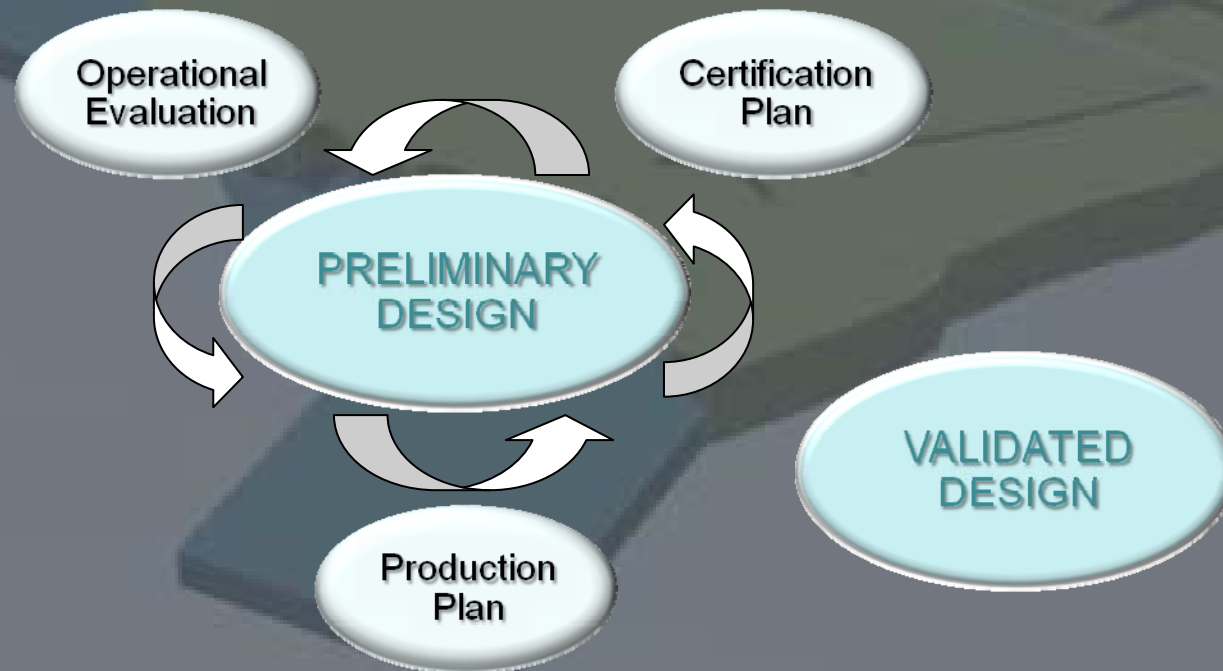
# SPECIFIC GOALS

## PHASE 1 ANALYSIS AND DESIGN

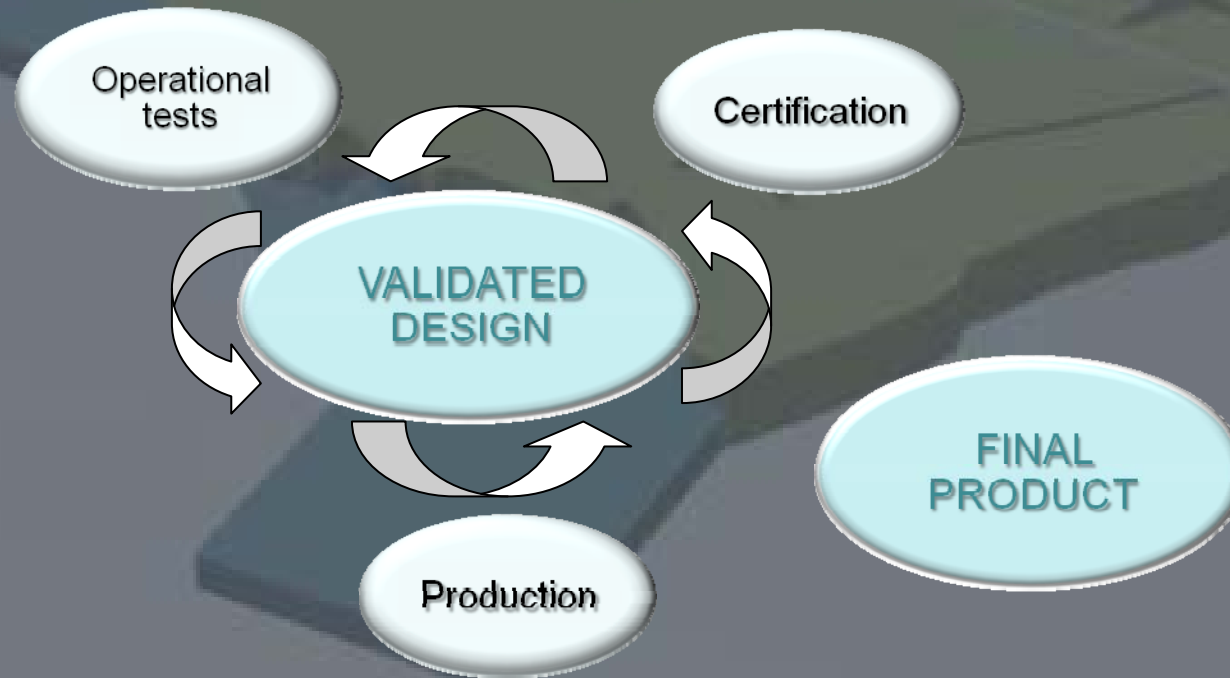




# SPECIFIC GOALS PHASE 2 SIMULATION



# SPECIFIC GOALS PHASE 3 PRE OPERATIONAL



# EXPECTED RESULTS



22.200 km

Ionosphere

800 km

Position +  $\epsilon$

80 km

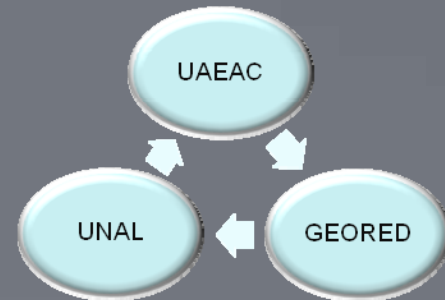
18 km

Troposphere

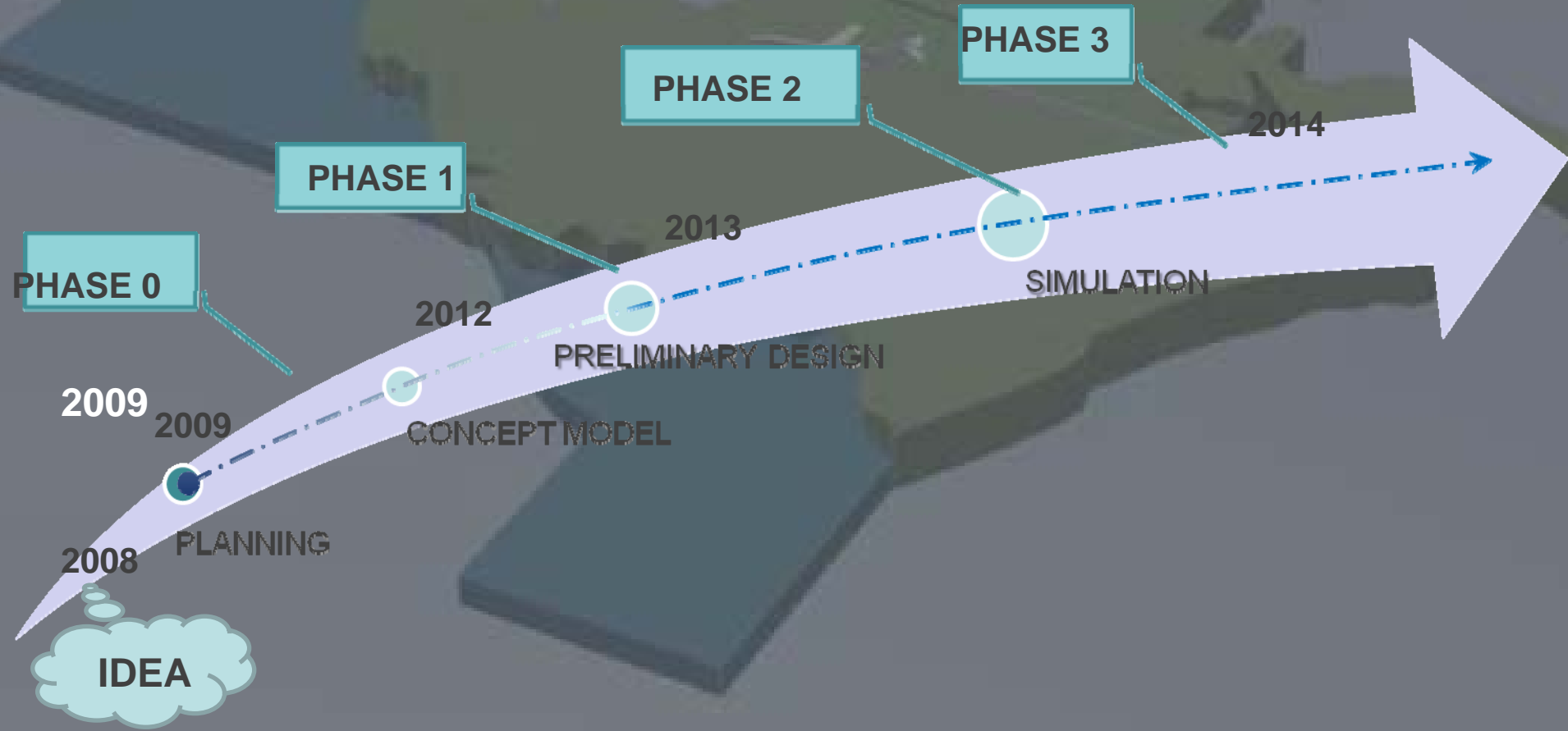


Reference position

Correction



# PROJECT EVOLUTION





Thanks

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**COLOMBIAN CIVIL AVIATION  
AUTHORITY**