



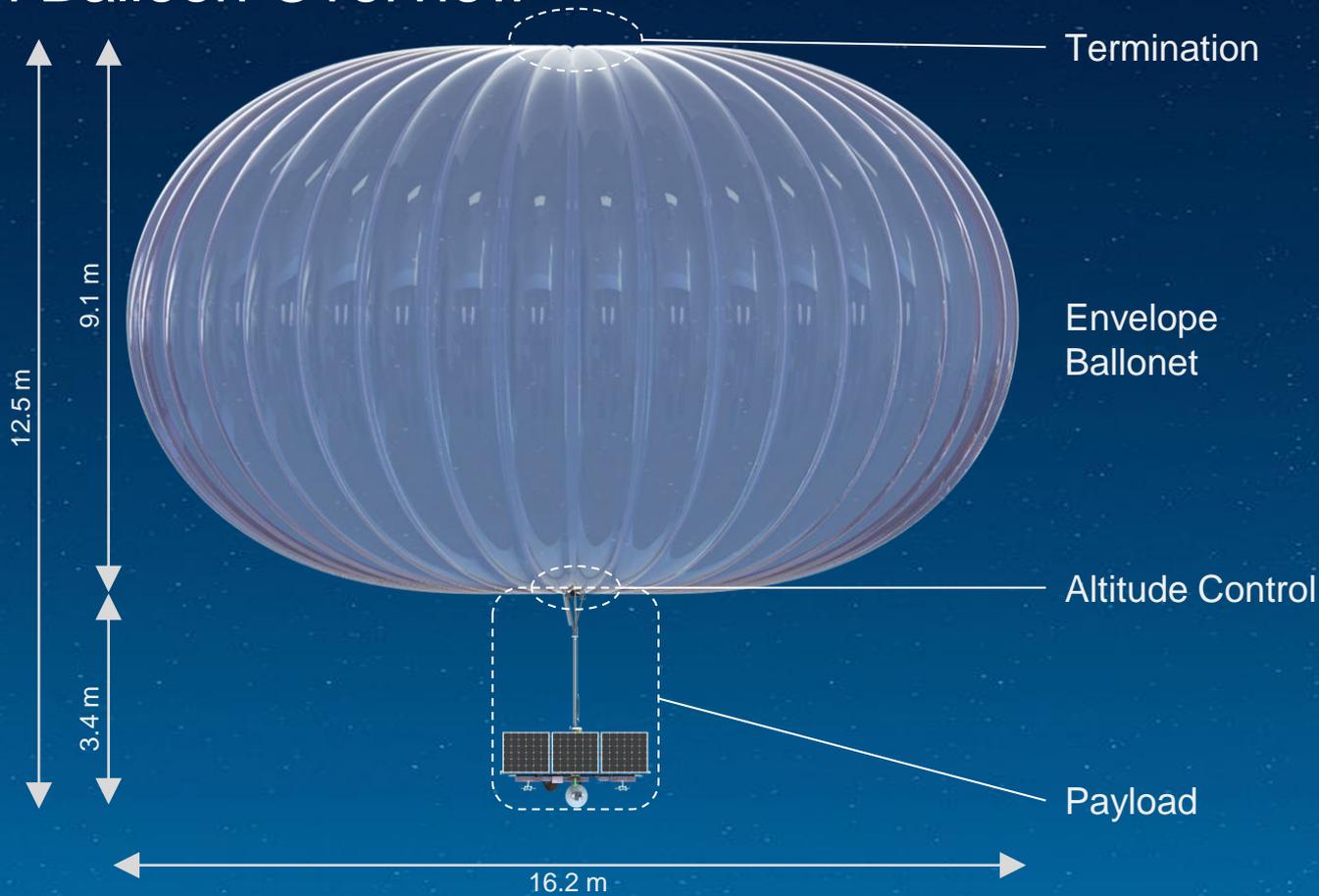
PROJECT LOON

BALLOON POWERED INTERNET
APIRG 21 | OCT 2017

Leonard Bouygues - In-flight Operations Manager



Loon Balloon Overview



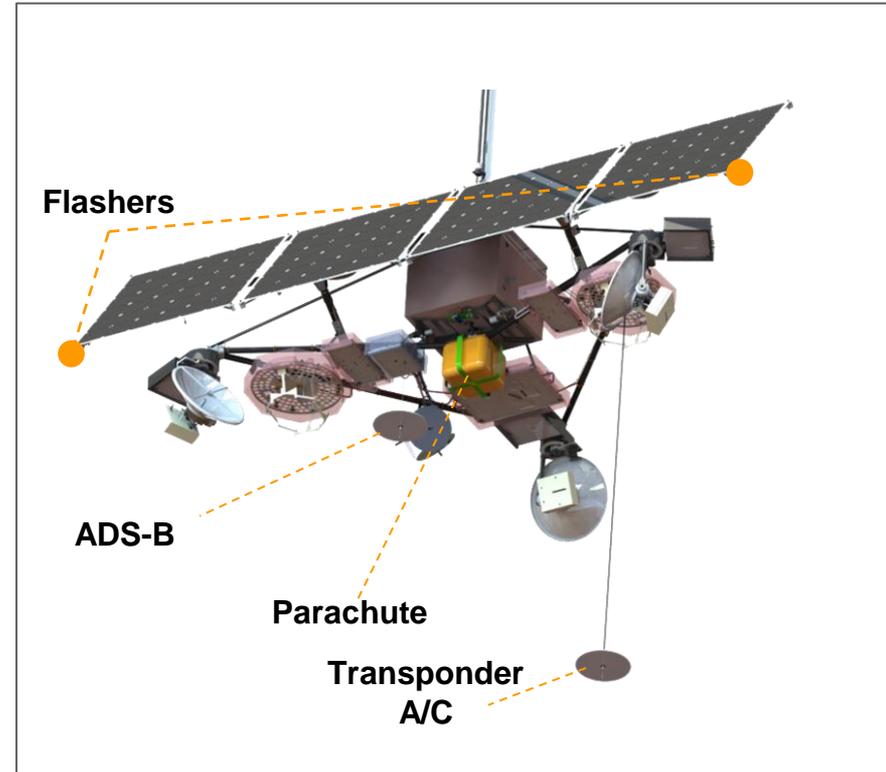
Safety Elements

REDUNDANT POSITION AND TRACKING

- **Certified Transponder**
(ADS-B out with Mode A/C)*
- Redundant GPS & barometric sensors
- **Independent & redundant communication**
(Iridium & Inmarsat)
- Omnidirectional flashers (> 5NM vis.)
- Radar Reflective Materials
- **Quasi-real time tracking website**

REDUNDANT FLIGHT TERMINATION

24*7 MISSION CONTROL OPERATION



Navigating purely with the wind



Flight Information

100+ Days
Duration

205 days record duration

Above air traffic

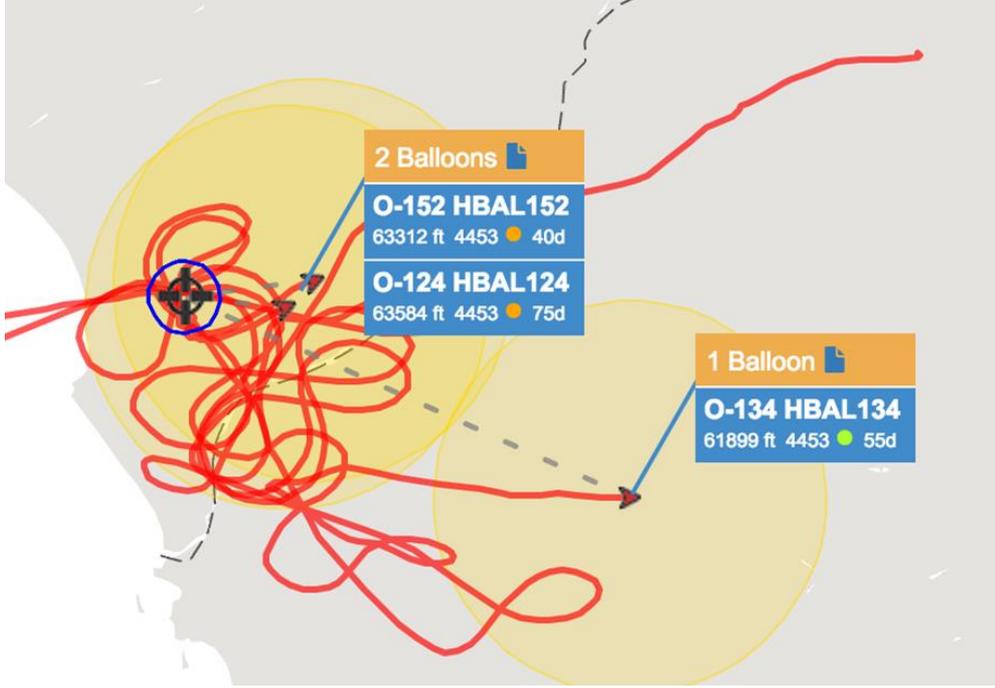
Always

850k hours

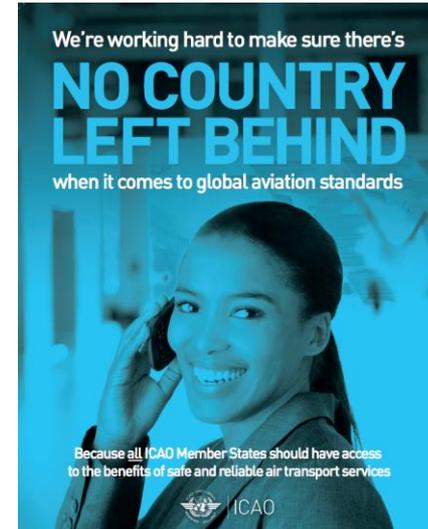
And more than 26M km
flown

24x7

Mission control in constant
Communication with ATC FL650



Thank you to United Nations & ICAO



- Endorsed global technical solutions consistent with SARPs, including Project Loon
- Recognized that Project Loon Supports SDGs 9 & 17 and ICAO NCLB
- Recommended that States finalize operational Letters of Agreement with Project Loon



ICAO State Letter

PUBLISHED: FRI, 17 JUNE 2016

DRAWS MEMBER STATES ATTENTION TO PROJECT LOON



International
Civil Aviation
Organization

Organisation
de l'aviation civile
internationale

Organización
de Aviación Civil
Internacional

Международная
организация
гражданской
авиации

منظمة الطيران
المدني الدولي

国际民用
航空组织

Tel.: +1 514-954-8219 ext. 5323

Ref.: AN13/22.1-16/42

17 June 2016

Subject: High Altitude Operations of
Unmanned Free Balloons

Action required: to assess impacts, as necessary

Sir/Madam,

1. I have the honour to draw your attention to Google Inc.'s "Project Loon", which aims to employ unmanned free balloons at high altitude to provide trans-global internet access.
2. As this first-of-its-kind project is being implemented and increasingly impacting the global airspace, I respectfully draw your attention to Annex 2 — *Rules of the Air*, Appendix 5, *Unmanned Free Balloons*. The enhancement of ICAO provisions applicable to unmanned free balloons so as to provide scope commensurate for the future growth of this aspect of civil aviation is currently underway.
3. To further assist you with assessing mechanisms to support safety and flight operations within your airspace in light of the potential for this heretofore unanticipated increase in high altitude balloon traffic, please also find enclosed – for informational purposes only – a briefing sheet prepared and furnished by Google on the project, as well as samples of some individual Member States' standards and procedures with regard to unmanned free balloons. I am hopeful that this information will prove useful.

Accept, Sir/Madam, the assurances of my highest consideration.

Fang Liu
Secretary General

Enclosures:

- A — Project 'Loon' briefing sheet
- B — Examples of individual State standards and procedures for unmanned free balloons

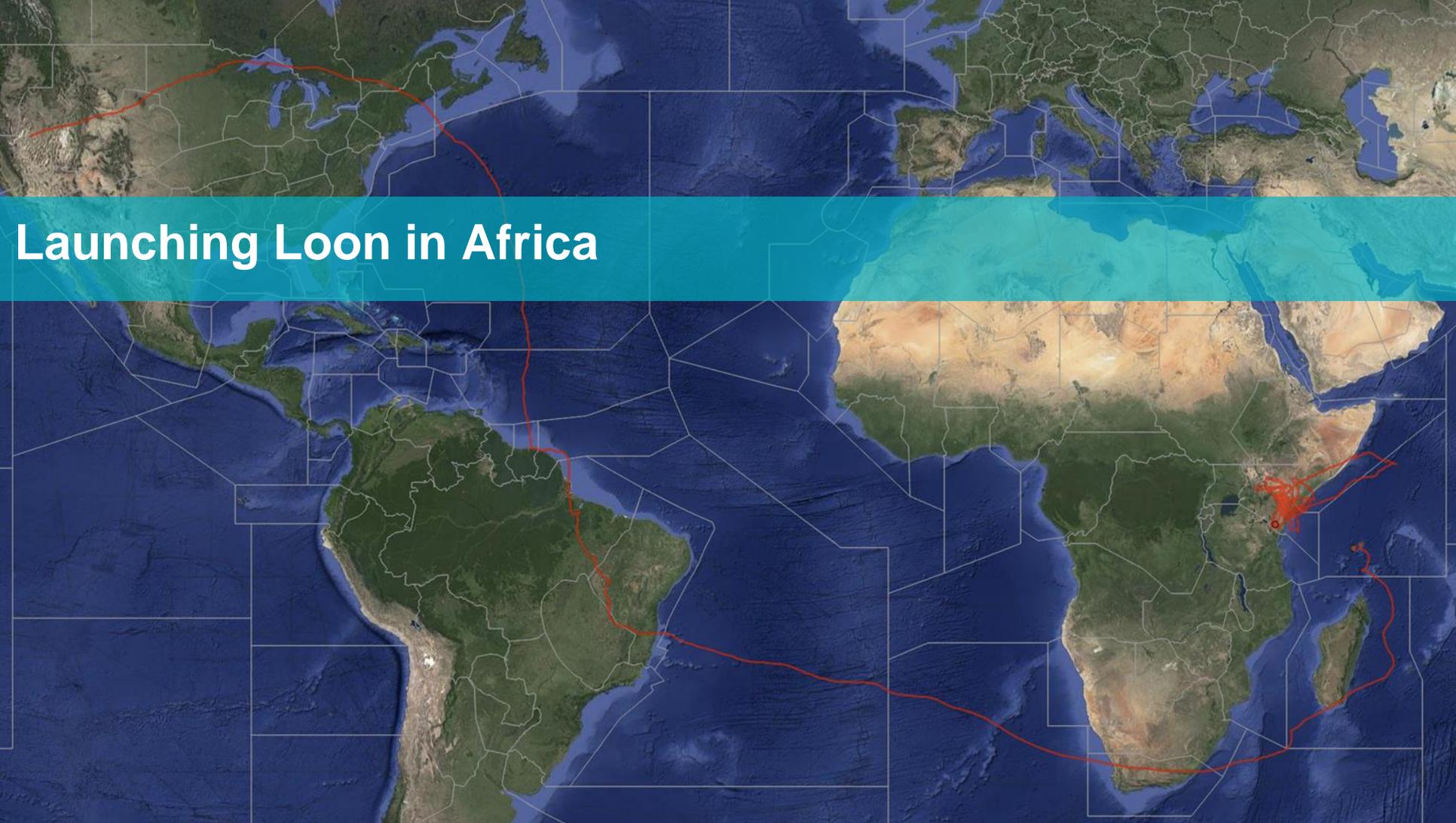
Steps to deployment



- Safety & Science
- Aviation Cooperation & Overflights
- Cross Ministry Coordination (Aviation, Communication, Defense)
- Telecommunications Agreement
- Service Delivery

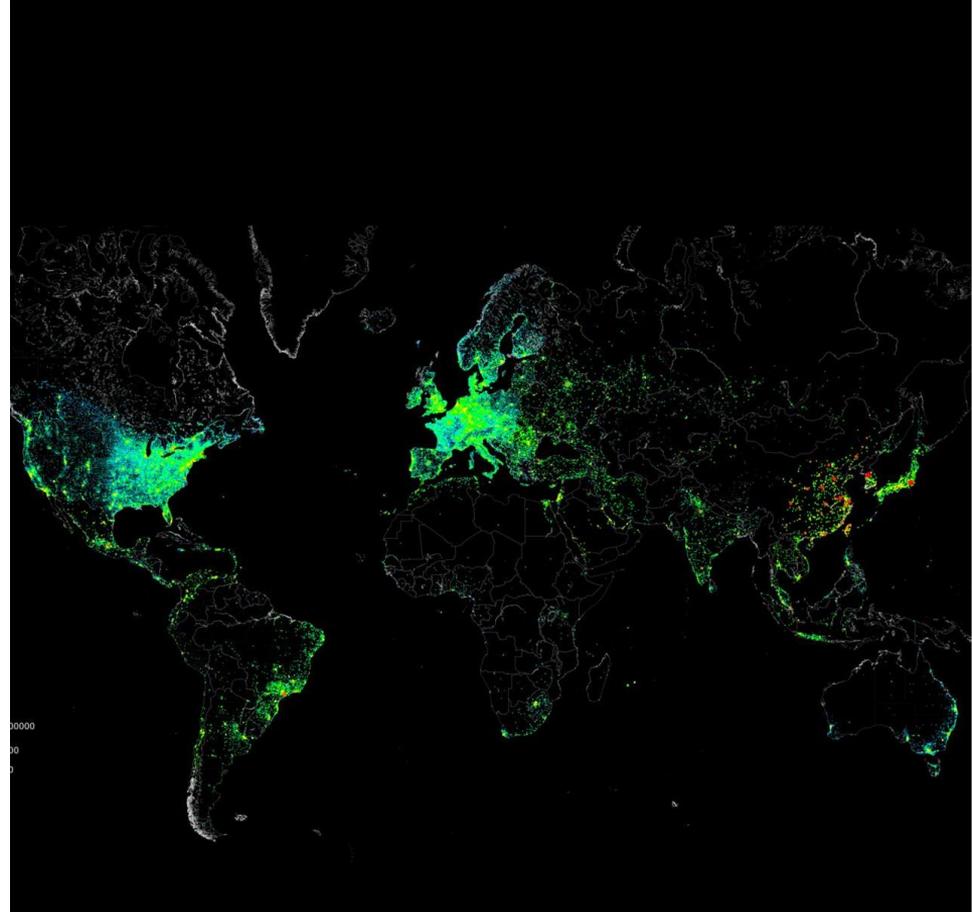


Launching Loon in Africa



Actions by the Meeting

- **Note the Intent of Project Loon to support UN SDGs and ICAO No Country Left Behind Initiative**
- **Note Secretary General's State Letter encouraging standardized procedures**
- **Recognize the benefits the internet can bring to the underserved**
- **Cooperate with Project Loon by entering into standardized overflight agreement so that Loon can expand its worldwide testing and implementation of service**



Thank You !



Leonard Bouygues
leonardb@google.com
+1-617-453-8727