



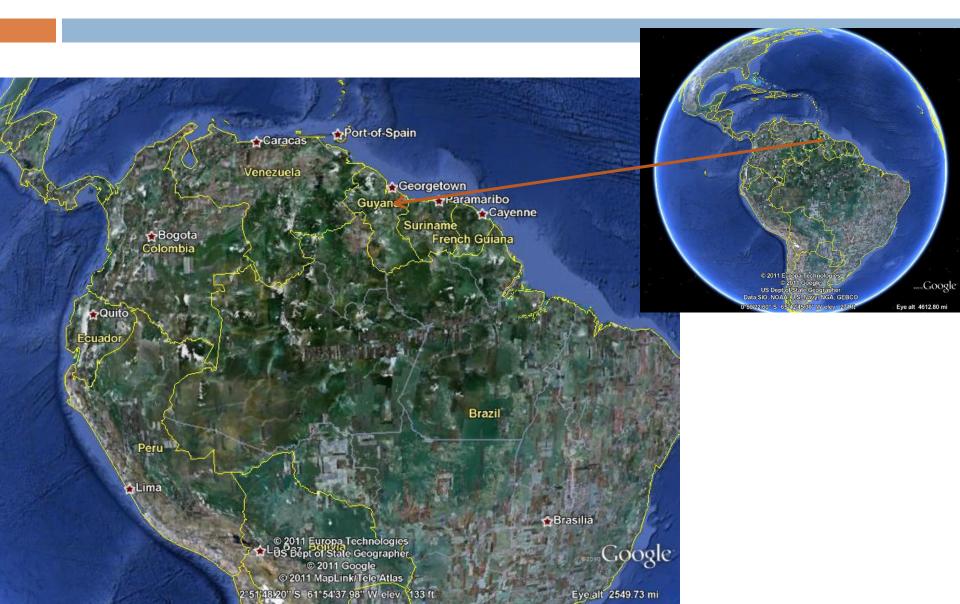
# GEODETIC INFRASTRUCTURE IN GUYANA

Donald Singh
Sworn Land Surveyor

#### **Presentation Outline**

- Location of Guyana
- Guyana's Country Profile
- Geodetic Infrastructure
- Strategic Plans
- Conclusions

# Location Map - Guyana



Country Profile

**Language**: The only English speaking country in South America

Population: 761,400

(UN2010)

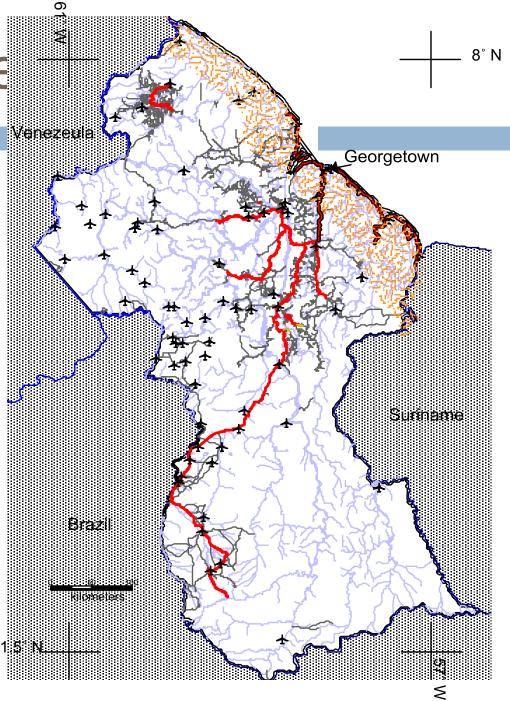
**Area**: 214,969 sq Km

Currency: GY\$ (~ 2 Colones)

Capital: Georgetown

**Major Challenges:** 

Most of the Population lives on the Coast, which is 2m below MSL



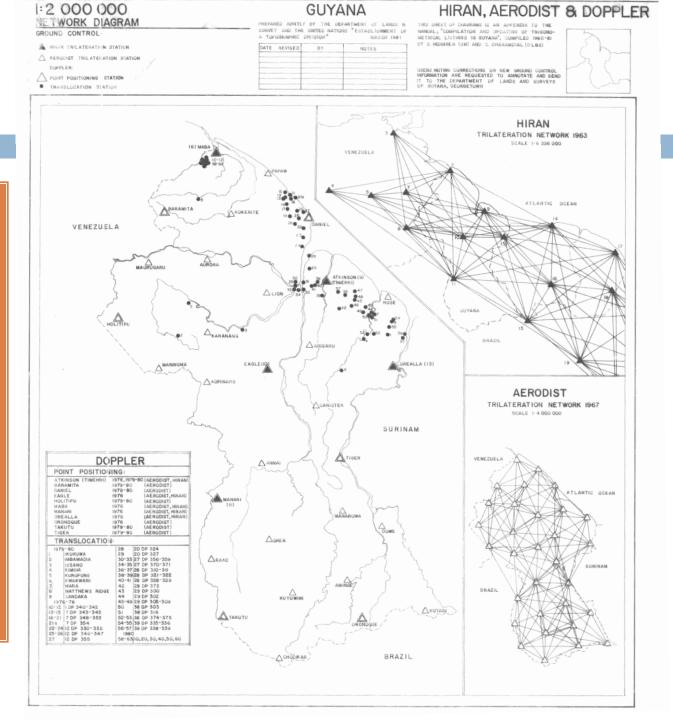
#### Geodetic Infrastructure

- Reference Framework
- Data
- Physical Components
- Intellectual Components
- Institutional Arrangements

#### Reference Framework

- Guyana employs a "localised" Provisional South American 1956 Datum (ASPRS2006);
  - □ International 1924 Ellipsoid (a= 6,378,388 and 1/f = 297)
  - □ Delta x : -298m ± 6m
  - □ Delta y: +159m ± 14m
  - □ Delta z: -369m ± 6m
- the Georgetown Vertical Datum is set to 56 feet below MSL of which traverses have been done along the coast.
- Guyana straddles 2 UTM zones; Z20 and 21 North.
- No geoid model in place...

**PSAD 1956** Datum was derived from the HIRAN network with adjustments from astrofixes and traverses of Aerodist Surveys



#### Data

Horizontal geodetic data exist as:

Scanned copies of station data Transcribed to excel in some cases, and in old survey plans

Actual results computations or adjustments and delivery systems for data difficult to available, but likely to be

NAME: EAGLE DATE ESTABLISHED: AERODIST 1968 (HIRAN 1959)

GEOGRAPHIC COORDINATES: Lot. 05° - 13' - 23".6660 Long. 59° - 06' - 10".0549

U.T.M. COORDINATES: Zone 21 Northing 577736.909 Meters Easting 266915.934 Meters

ELEVATION: 2416 FEET

LOCATION: The station is located in the Potaro District approximately 120 miles southwest of Georgetown and 6 miles southeast of Mahdia airstrip.

ROUTE DESCRIPTION: From Mahdia airstrip take the Bartica Road south to mile 118 where vehicle travel ends. Proceed along the prominent trail up the mountain for 5 miles to Rafferty's Mine and then I mile up the slope to the top of the ridge. Turn right, (south) i mile along the trail to a large rock and the station. Climbing time from mile 118 is 5 hours. Guides are available in the Potaro Village or mile 118.

STATION DESCRIPTION: The station is located approximately 6 miles southeast of Mahdia airstrip on a ridge extending north-south approximately  $\frac{1}{4}$  mile north of Eagle Mountain Peak. A camp site and helicopter pad were cleared. No tower was used for aerodist measurements.

MONUMENTATION: The station is marked by a standard USAF survey disk set in the centre of a very large rock that is 7 feet high on the north side sloping 20 feet to ground level. It is stamped "Eagle 1959".

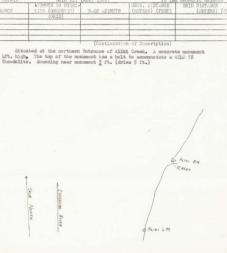
There are two reference marks each being a standard USAF disk set in granite rock. The Azimuth mark is a standard USAF disk set in the top of a concrete monument 12 inches square protruding 2 inches above surface and stamped "AZ. MK. 1959".

It is 9 feet north of C. Solomon's house, 75 feet west of the Bartica Road and at approximately Mile 117.5.

Accepting Lighthouse I.A.O.S. Value Given as Lat. N 060 kg \* 360 775 Long. N 580 09 kg 951

COUNTRY	TYPE OF MARK Concrete Honoment	STATION Aliki		
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(HORTHING) (BASTII (FT (H		GRID AND ZONE	DATE ORDER	
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	4.0	100 1		Sonhe 1345 350
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TO OBTAIN		(ADD) (SUB)		E GEODETIC AZIMUTH
OBJECT	AZIMUTH OR DIREC- TION (GROUPFIC) (GRID)	BACK AZIMUTH	GEOD, DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FI)
	-	(Continuatio	n of Description)	



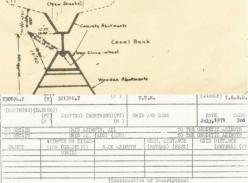
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*21-Y-1 D.05.1968						
2" above g.l. The						
when the canal	is died	sed.			(	790 792
Approx. Geographical Co	o-ordinates		Heigh	ŧ		3.8
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Local R.O.(		" Distance	es in Feet	Depth		
Trig R.O. ()		Horizont	al Vertical	G.L.	Der	cription
Buried Mark						
Witness Mark 1						
Witness Mark 2				-		
Witness Mark 3						
Witness Mark 4						
Old Station Mark						
PHOTO-IDENTIFIC	ATION (I	ield Book	No		p)	2
Hor	risontal Horizontal		Description		56.0 1717	
R.O.						
Photo. pt. 1						300
Photo. pt. 2						
Photo. pt. 3						Title edge of photo.
Air photo. nos. v5:	SB RAF 12	2 0019	DOLO		Measurements in	photo.no. 0020

for Mahaica, 26 miles away. The road continues (in a southerly direction), crosses the railway and after 1/2 mile turns last across the Mahaica River. Do not turn left across the bridge, but continue straight ahead along a lesser road towards Cane Grove This road posses through a village, runs close to the river for a short section then runs straight, just west of south for 2 miles when it turns sharp left into Cone Grove . This corner is 32 miles from the main coast road

At this corner term sharp right (away from Cone Grove) crossing a canal by a bridge to continue along this track for O. Emiles then follow it to the left for just under X-mile when it reaches the corner of the Lamaha Canal Here there is a watchman's house. The point is known as "Flagstaff"

The From Flaggraff tris peagible to walk along the canal bank to the station, or to track the bank to the station, or to track the bank the cyt-ti appearately 2M miles from flaggraff, just on the wast pine of the sufference to a canal, labelled as as New Shanks.

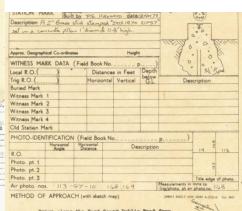
(New Shanks)



This station is approximately 10,000 feet North of Sexskalli. It is near to a tree with a wide trunk and pointed size mailed to it. The station is a one gallon paint one is the concrete. A bolt marks the centre of the station. The mark is under water at high water.







Drive along the East Coast Public Road from George town to Clonbrook. Turn right along the asphalt road towards Clombrook station. Continue asphalt road towards Clembrook station. Continue straight on amones the rallway and straight on along the "mane Chrove" and "Dlombrook" mideline dam. 3.6 miles beyond the railway the dam beads to the right. Continue along the dam for a total distance of 4.4 miles to the end. Nail. 300 yards South Mantaland along a dam to a morner. The post lies about 70 yards East of this corner possible during naise even with a 4 wheel drive whiches.

It is possible to walk to this point from 21 731.

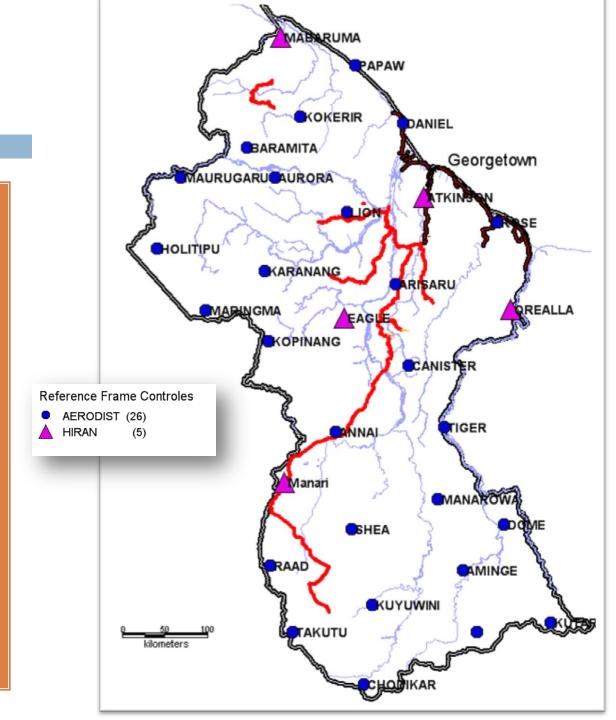


## Physical Components

- The Geodetic Network of Guyana consists of thirty-one (31) Aerodist Stations, established during the period 1967-1968, five of which are identical with Hiran Stations established previously as part of a South America Tri-lateration control survey of 1963.
- Secondary Networks
  - (a) Inter American Geodetic Surveys (I.A.G.S) 25 stations.
  - (b) Directorate of Overseas Surveys (D.O.S); both Horizontal and Vertical Controls localised along the coastland (401 st).
  - (c) United Nations Development Programme (UNDP) Horizontal Network - Timehri Airport to Eagle Mountain.
  - (d) The 90 bench Marks located in the three (3) Towns that are part of the Guyana Water Authority Network. Benchmarks exist along the coast. These are well defined and accessible.

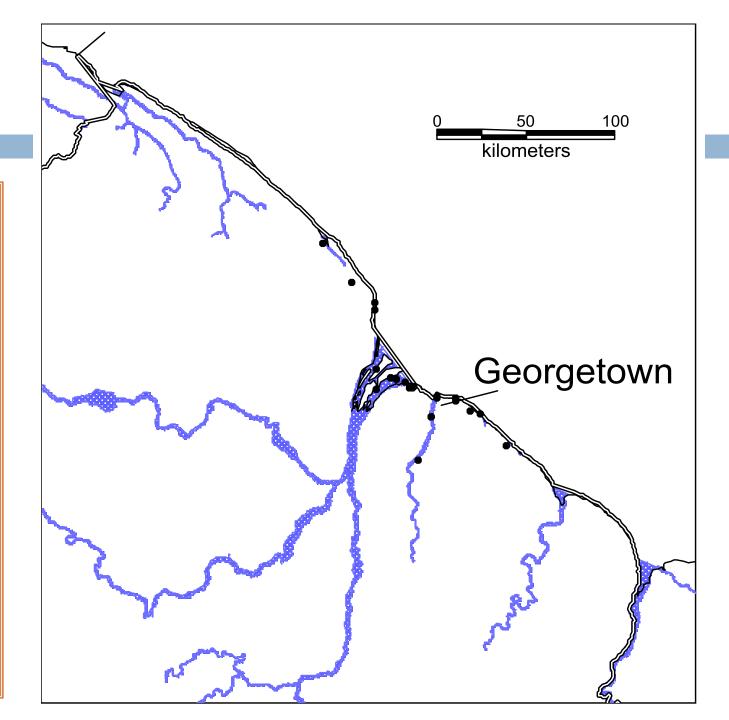
Primary Horizontal Geodetic Controles

United Nations
Development
Programme
(UNDP) –
Horizontal
Network Timehri Airport
to Eagle
Mountain



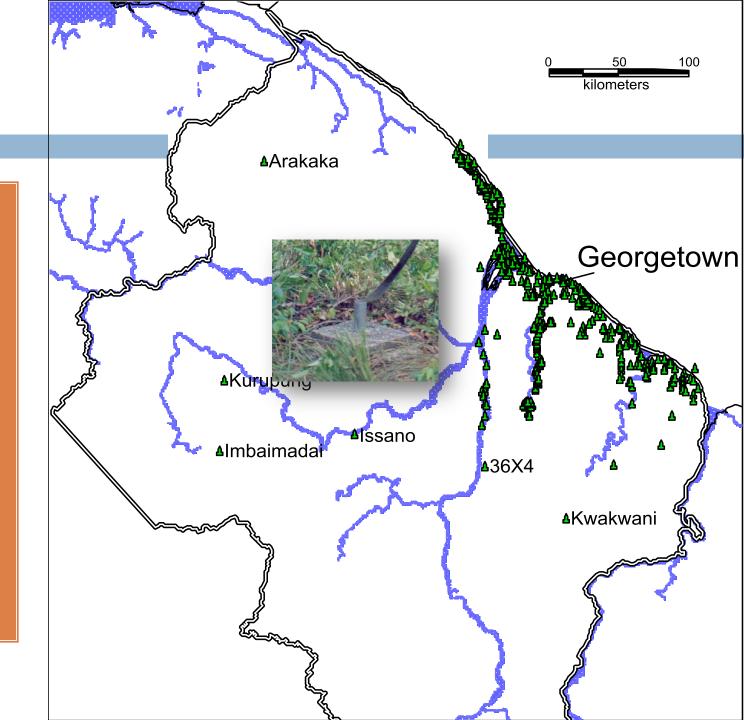
Inter American Geodetic Surveys (I.A.G.S)

23 Stations
Confined
mainly along
the Coast



Directorate
of Overseas
Surveys
(D.O.S);
both
Horizontal
and Vertical
Controls
localised
along the
coastland

(407 Controles)



# Intellectual and Institutional Component

The Guyana Lands and Survey Commission

- The Geodetic Network is managed by the Geodetic Section, which comes under the Surveys Division of the Lands and Survey Commission
- The Section is staffed by <10</li>
   Surveyors
- Currently no staff of the Commission has a degree in Geodesy
- Laws are in draft to permit GPS

### Institutional Component con'd

Academi c Institution s

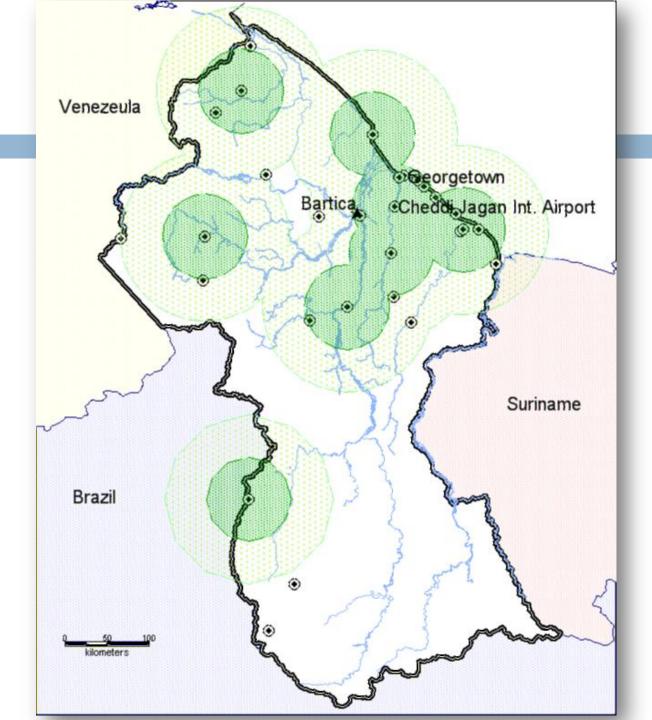
- The Government Technical Institute offers a Diploma in Surveying (land)
- No further specialization, however, surveying is taught as part of engineering courses (no geodesy)
- No GNNS/GPS courses at the university level

### Strategic Plans

#### Geodetic Modern

- Adopt new legislation to recognize GNNS/GPS surveys
- Upgrade Geodetic Infrastructure
  - Install 6 CORS network
  - Integrate into SIRGAS
  - Develop transformation parameters for PSAD 1956 – SIRGAS
- Develop Geodetic Capacity through collaboration with existing agencies (SIRGAS, Government Scholarships, etc.)

Preliminary
Layout of
Network with
2 alternating
stations



# Gracias!