

## O3b Network Return Link Analysis - Tier 1 Service For Suva, Fiji

Link Budget Creator - Rev 1.1: July 15, 2010		Tier 1	Tier 1
Ground Parameter		Teleport	Telco
Location		Sunset Beach RHCP, United States	Suva
Latitude	(°)	21.3	-18.1
Longitude (East)	(°)	201.9	178.4
E/S Range to SV	(km)	9831.6	8633.3
E/S Elevation to SV	(°)	34.6	57.9
E/S Altitude	(m)	0.0	0.0
SV Beam Identifier	(#)		12
Minutes Into Pass (Sample #37)	(Min)		17.4
Telco Spot Beam Off-Angle	(°)		0.2
Telco Spot Beam Diameter	(km)		60.1
Maximum Roundtrip Latency	(msec)		123.2
Modulation Parameters		Forward	Return
Enter Receiver	Type		DVB-S2
Available Bandwidth	(Hz)		40,003,200
Channel Symbol Rate	(sps)		33,336,000
Channel Modulation Type			16APSK
Channel FEC Rate			0.75
Channel Spectral Efficiency	(bits/Hz)		3.00
Channel Throughput (100% / 100% of Full Rate)	(bps)		96,551,732.47
Uplink		Forward	Return
E/S Tx Channels per HPA	(#)		1
E/S Tx Carrier Frequency	(MHz)		28020.00
E/S Tx HPA Power Level	(W)		500.00
E/S Tx OBO	(dB)		-1.50
E/S Tx Post-HPA Losses	(dB)		-2.86
E/S Tx Antenna Gain (4 meter)	(dB)		58.96
E/S Tx EIRP Per Channel	(dBW)		81.59
E/S Tx Pointing Loss	(dB)		-0.50
E/S Tx RF Link Availability	(%)		99.600
E/S Tx Atmospheric Losses	(dB)		-18.58
E/S Tx Spreading Loss	(dB)		-149.72
Satellite		Forward	Return
SV Number of Channels per HPA	(#)		4
SV Rx G/T	(dB/K)		3.15
SV Rx Power Per Tier	(dBW)		-134.46
SV Rx Flux Density Per Tier	(dBW/m <sup>2</sup> )		-87.21
SV Tx OBO	(dB)		-5.80
SV Tx Post-TWTA Losses	(dB)		-1.50
SV Tx Antenna Gain	(dBi)		30.97
SV Tx EIRP Per Channel/Carrier	(dBW)		35.78
SV Tx Pointing Loss	(dB)		0.00
Downlink		Forward	Return
E/S Rx Carrier Frequency	(MHz)		18220.00
E/S Rx Spreading Loss	(dB)		-150.84
E/S Rx RF Link Availability	(%)		99.600
E/S Rx Atmospheric Losses	(dB)		-7.79
E/S Rx Pointing Loss	(dB)		-0.50
E/S Rx Antenna Gain ( 7.3 meter)	(dBi)		61.08
E/S Rx Effective G/T	(dB/K)		35.49
E/S Rx Power Per Channel	(dBW)		-108.94
E/S Rx Flux Density Per Channel	(dBW/m <sup>2</sup> )		-123.35
Total Link		Forward	Return
Carrier / Noise Bandwidth	(dB)		75.23
Carrier / Noise Uplink	(dB)		18.91
Carrier / Noise Downlink	(dB)		18.84
Carrier / Intermodulation Im (C/Im)	(dB)		19.20
(C/N) - Total Actual	(dB)		13.86
(C/N) - Total Required	(dB)		13.61
(E <sub>p</sub> /N <sub>0</sub> ) - Total Actual	(dB)		9.09
(E <sub>p</sub> /N <sub>0</sub> ) - Total Required	(dB)		8.84
Excess Margin	(dB)		0.25
Fade Margin (to loss of link)	(dB)		15.01