

## 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)		10383.1	8796.8
E/S Elevation to SV	(°)		27.0	53.7
E/S Altitude	(m)		0.0	0.0
SV Beam Identifier	(#)			12
Minutes Into Pass (Sample #22)	(Min)			10.2
Telco Spot Beam Off-Angle	(°)			0.2
Telco Spot Beam Diameter	(km)			60.1
Maximum Roundtrip Latency	(msec)			128.0
Modulation Parameters			Forward	Return
Enter Receiver	Type			DVB-S2
Available Bandwidth	(Hz)			216,000,000
Channel Symbol Rate	(sps)			180,000,000
Channel Modulation Type				QPSK
Channel FEC Rate				0.25
Channel Spectral Efficiency	(bits/Hz)			0.50
Channel Throughput (100% / 100% of Full Rate)	(bps)			86,143,861.55
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)			-2.00
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)			81.09
E/S Tx Pointing Loss	(dB)			-0.50
E/S Tx RF Link Availability	(%)			99.850
E/S Tx Atmospheric Losses	(dB)			-28.74
E/S Tx Spreading Loss	(dB)			-149.88
Satellite			Forward	Return
SV Number of Channels per HPA	(#)			4
SV Rx G/T	(dB/K)			3.32
SV Rx Power Per Tier	(dBW)			-145.11
SV Rx Flux Density Per Tier	(dBW/m <sup>2</sup> )			-98.03
SV Tx OBO	(dB)			-5.80
SV Tx Post-TWTA Losses	(dB)			-1.50
SV Tx Antenna Gain	(dBi)			30.99
SV Tx EIRP Per Channel/Carrier	(dBW)			35.80
SV Tx Pointing Loss	(dB)			0.00
Downlink			Forward	Return
E/S Rx Carrier Frequency	(MHz)			18220.00
E/S Rx Spreading Loss	(dB)			-151.32
E/S Rx RF Link Availability	(%)			99.850
E/S Rx Atmospheric Losses	(dB)			-14.67
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)			34.82
E/S Rx Power Per Channel	(dBW)			-116.28
E/S Rx Flux Density Per Channel	(dBW/m <sup>2</sup> )			-130.69
Total Link			Forward	Return
Carrier / Noise Bandwidth	(dB)			82.55
Carrier / Noise Uplink	(dB)			0.93
Carrier / Noise Downlink	(dB)			3.51
Carrier / Intermodulation Im (C/Im)	(dB)			19.95
(C/N) - Total Actual	(dB)			-1.07
(C/N) - Total Required	(dB)			-1.15
(E <sub>s</sub> /N <sub>0</sub> ) - Total Actual	(dB)			1.94
(E <sub>s</sub> /N <sub>0</sub> ) - Total Required	(dB)			1.86
Excess Margin	(dB)			0.08
Fade Margin (to loss of link)	(dB)			0.08