

## O3b Network Forward 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)	10152.1	8712.6
E/S Elevation to SV	(°)	30.0	55.8
E/S Altitude	(m)	0.0	0.0
SV Beam Identifier	(#)	12	
Minutes Into Pass (Sample #28)	(Min)	13.1	
Telco Spot Beam Off-Angle	(°)	0.2	
Telco Spot Beam Diameter	(km)	60.1	
Maximum Roundtrip Latency	(msec)	125.9	
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		16APSK	
Channel FEC Rate		0.75	
Channel Spectral Efficiency	(bits/Hz)	3.00	
Channel Throughput	(bps)	521,337,648.33	
Uplink		Forward	Return
E/S Tx Channels per HPA	(#)	5	
E/S Tx Carrier Frequency	(MHz)	28020.00	
E/S Tx HPA Power Level	(W)	500.00	
E/S Tx OBO	(dB)	-3.00	
E/S Tx Post-HPA Losses	(dB)	-1.50	
E/S Tx Antenna Gain (7.3 meter)	(dB)	64.82	
E/S Tx EIRP Per Channel	(dBW)	80.32	
E/S Tx Pointing Loss	(dB)	-0.50	
E/S Tx RF Link Availability	(%)	98.000	
E/S Tx Atmospheric Losses	(dB)	-7.45	
E/S Tx Spreading Loss	(dB)	-151.12	
Satellite		Forward	Return
SV Number of Channels per HPA	(#)	1	
SV Rx G/T	(dB/K)	4.09	
SV Rx Power Per Tier	(dBW)	-125.07	
SV Rx Flux Density Per Tier	(dBW/m <sup>2</sup> )	-78.75	
SV Tx OBO	(dB)	-6.50	
SV Tx Post-TWTA Losses	(dB)	-1.50	
SV Tx Antenna Gain	(dBi)	30.76	
SV Tx EIRP Per Channel/Carrier	(dBW)	40.89	
SV Tx Pointing Loss	(dB)	0.00	
Downlink		Forward	Return
E/S Rx Carrier Frequency	(MHz)	18220.00	
E/S Rx Spreading Loss	(dB)	-149.80	
E/S Rx RF Link Availability	(%)	98.000	
E/S Rx Atmospheric Losses	(dB)	-3.17	
E/S Rx Pointing Loss	(dB)	-0.50	
E/S Rx Antenna Gain (4 meter)	(dBi)	55.22	
E/S Rx Effective G/T	(dB/K)	30.74	
E/S Rx Power Per Channel	(dBW)	-104.02	
E/S Rx Flux Density Per Channel	(dBW/m <sup>2</sup> )	-112.57	
Total Link		Forward	Return
Carrier / Noise Bandwidth	(dB)	82.55	
Carrier / Noise Uplink	(dB)	20.98	
Carrier / Noise Downlink	(dB)	17.54	
Carrier / Intermodulation Im (C/Im)	(dB)	20.48	
(C/N) - Total Actual	(dB)	14.24	
(C/N) - Total Required	(dB)	13.61	
(E <sub>b</sub> /N <sub>0</sub> ) - Total Actual	(dB)	9.46	
(E <sub>b</sub> /N <sub>0</sub> ) - Total Required	(dB)	8.84	
<b>Excess Margin</b>	<b>(dB)</b>	<b>0.63</b>	
<b>Fade Margin (to loss of link)</b>	<b>(dB)</b>	<b>15.39</b>	