

# American Samoa Infrastructure Priority Projects

## SHORELINE PROTECTION

Territorial Climate and Infrastructure Workshop  
March 28-30, 2022  
Office of Insular Affairs

Presented by:

ASG Director Christopher King Department of Port Administration

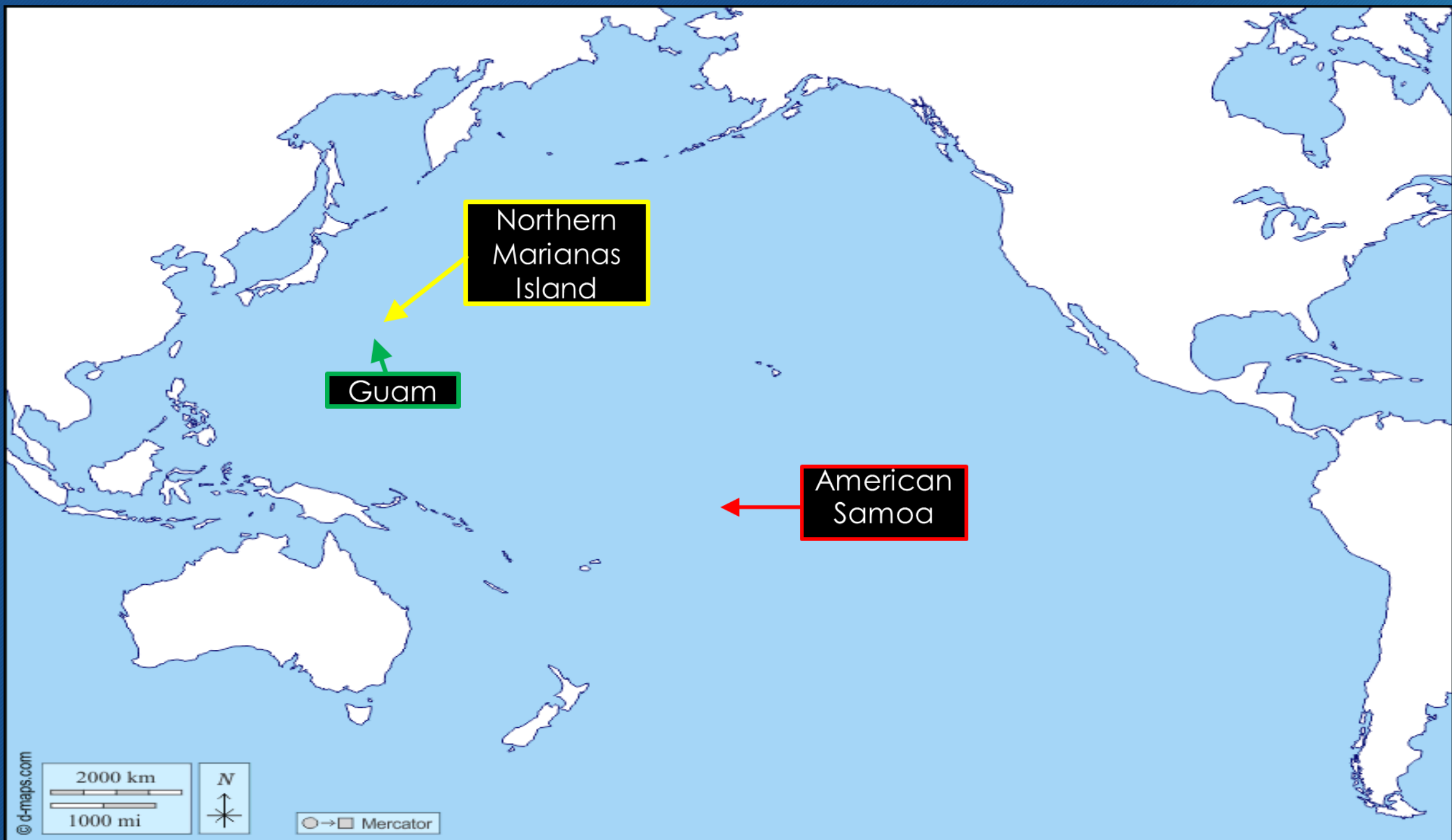
ASG Director Faleosina Voight Department of Public Works



# OVERVIEW - SHORELINE PROTECTION

- PROJECT LOCATIONS
- A.S HIGHWAYS / SHORELINE INVENTORY
- PROJECT OBJECTIVES
- PROJECT REVIEW
  - Manua Shorelines – OFU Island
  - Central Shorelines
  - Eastern Shorelines
  - Western Shorelines
- CHALLENGES





Northern  
Marianas  
Island

Guam

American  
Samoa



# SAMOA ISLANDS

To Swains Island  
200mi  
320km

To Hawaii  
2600mi  
4700km

To U.S. mainland  
4800mi  
7700km

## SOUTH PACIFIC OCEAN

**SAMOA**  
(formerly Western Samoa)

SAVAI'I

Apolima

Manono

Apia

'UPOLU

## AMERICAN SAMOA

(U.S. territory)

TUTUILA

'Aunu'u Island

Pago Pago

Ofu

Olosega

Ta'u

MANU'A ISLANDS

To Tahiti  
1500mi  
2400km

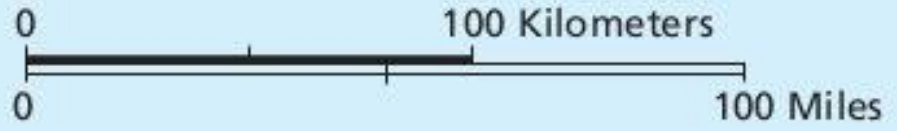
Rose Atoll

To Australia  
2500mi  
4000km

To Fiji  
800mi  
1200km

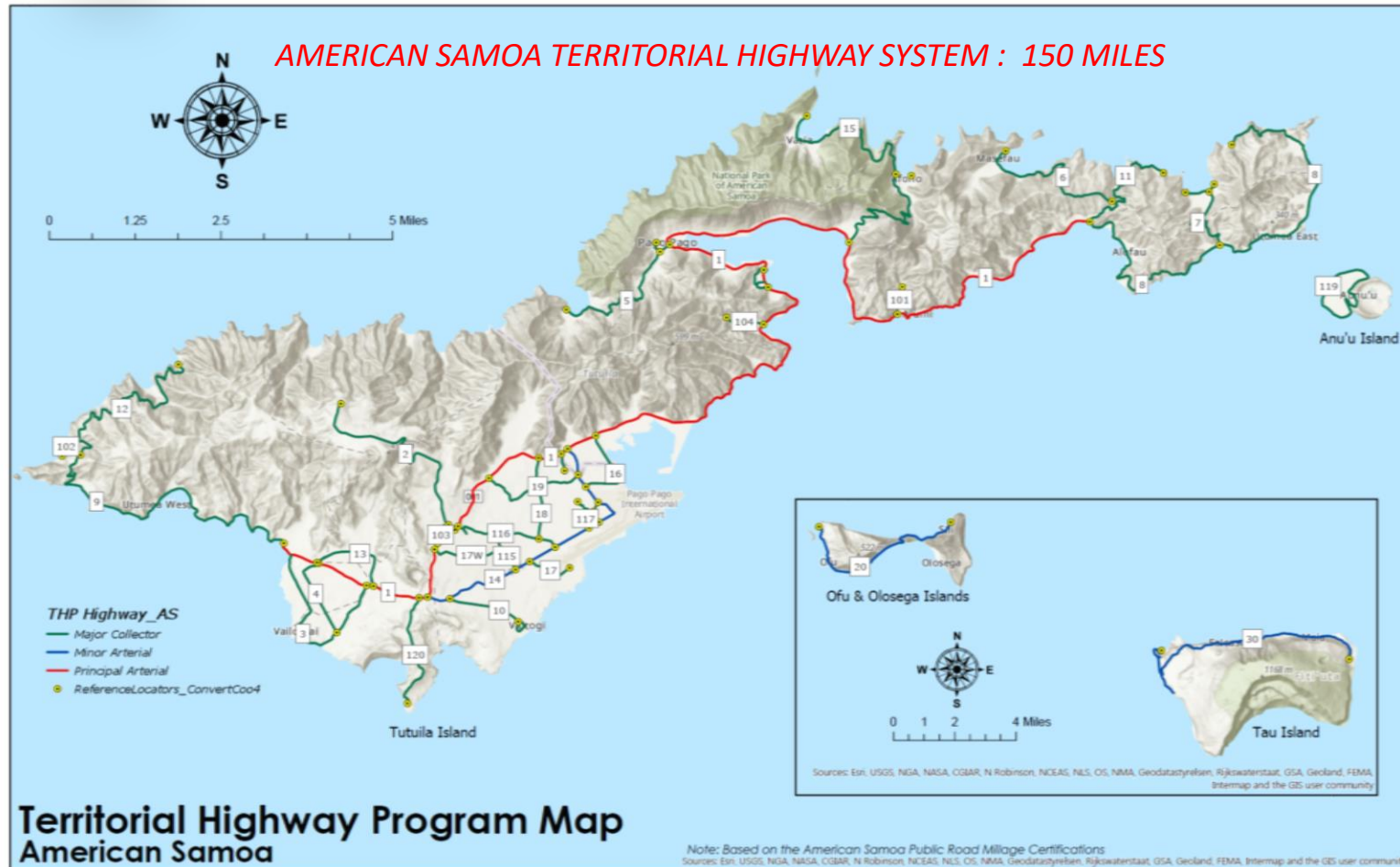
To New Zealand  
1800mi  
2800km

INTERNATIONAL DATE LINE





# AS Territorial Highway Program



TUTUILA MAIN ROUTES FROM EAST TO WEST			FUNCTIONAL CLASSIFICATION
ROUTE 001	22.21	MILES	PRINCIPAL ARTERIAL
ROUTE 008	7.65	MILES	MAJOR COLLECTOR
ROUTE 009	5.22	MILES	MAJOR COLLECTOR
ROUTE 012	4.28	MILES	MAJOR COLLECTOR
SUB-TOTAL	39.36	MILES	
ALL OTHER ROUTES	91.73	MILES	
MANUA MAIN ROUTES			FUNCTIONAL CLASSIFICATION
ROUTE 020	6.41	MILES	MINOR ARTERIAL
ROUTE 030	9.88	MILES	MINOR ARTERIAL
TOTAL	16.30	MILES	
AUNU'U MAIN ROUTE FROM EAST TO WEST			FUNCTIONAL CLASSIFICATION
ROUTE 119	2.61	MILES	LOOP ROAD

**STATISTICAL YEARBOOK 2015**

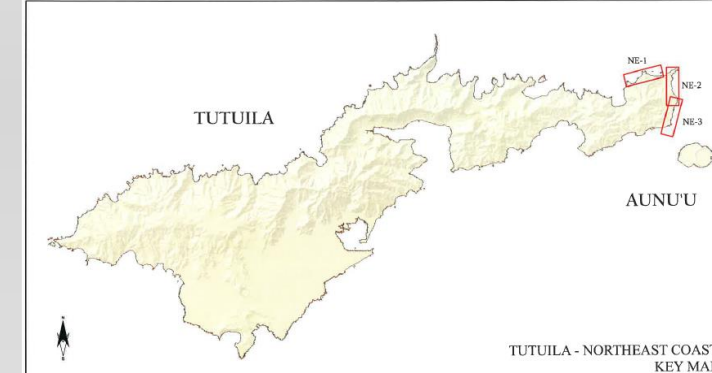
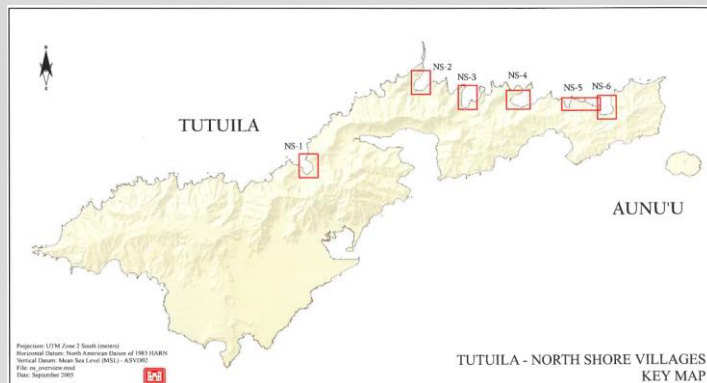
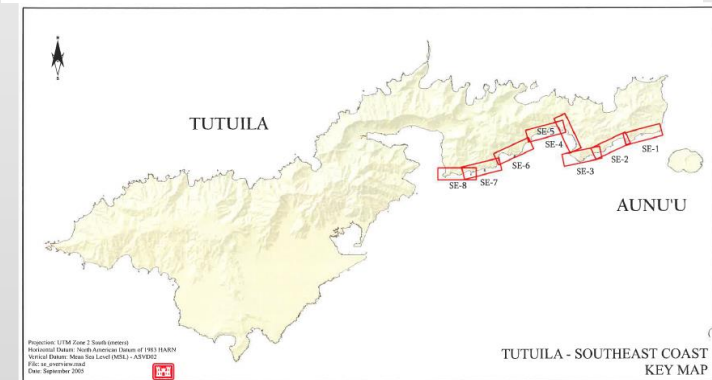
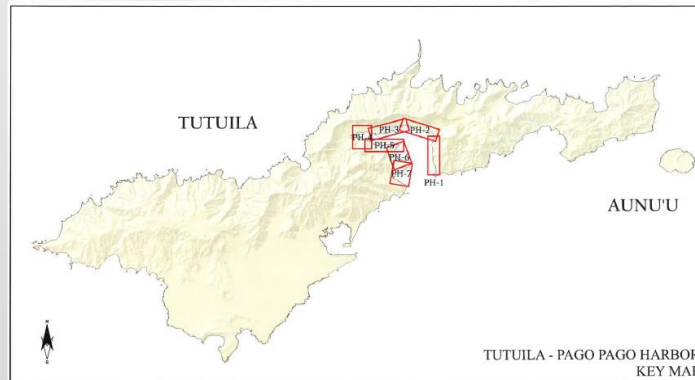
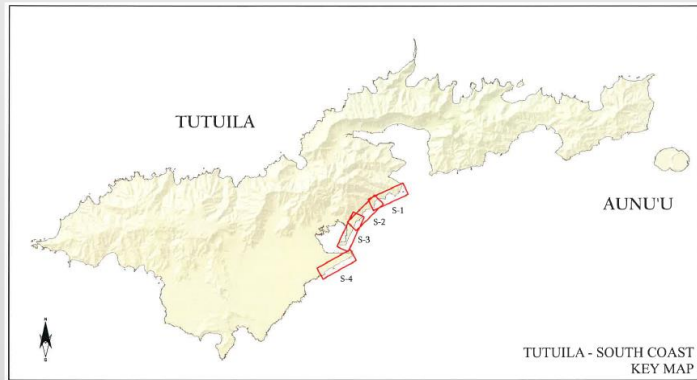
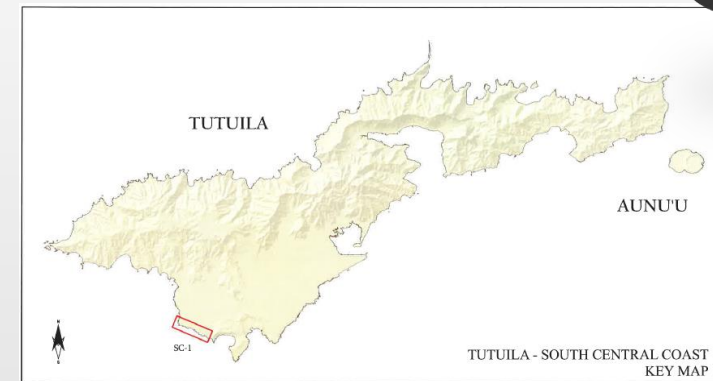
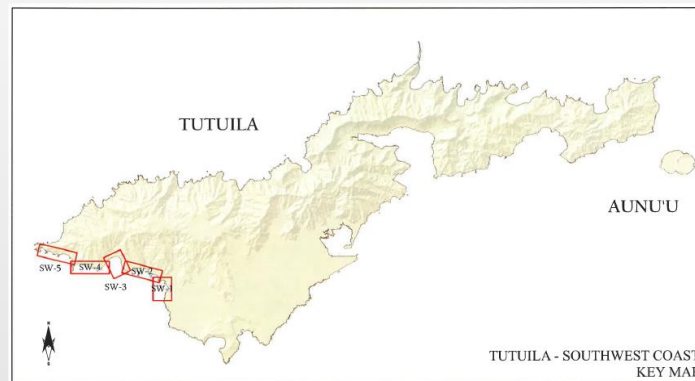
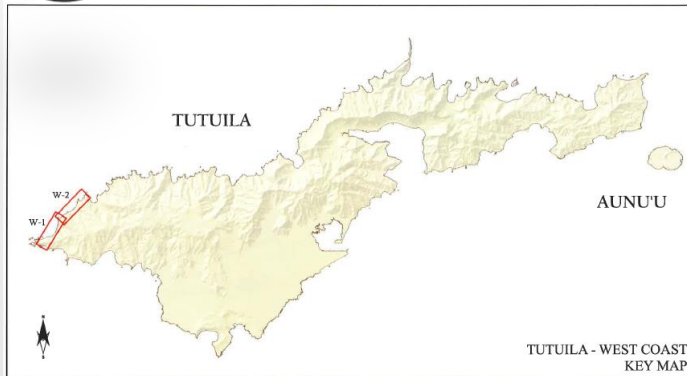
Table 14.1 BALANCE OF TRADE - ALL ITEMS [US\$000]

Period	Exports FOB			Imports CIF			Trade Balance Surplus(+) / Deficit(-)
	Domestic	Re-exports	Total	Commerces	Government	All others	
2005	455,752	4,116	459,868	219,984	9,583	313,439	543,005
2006	452,334	5,791	458,125	215,626	8,589	401,008	625,223
2007	463,830	5,530	469,360	203,173	8,052	316,150	527,375
2008	592,467	8,602	601,069	214,620	6,295	434,447	655,361
2009	491,239	5,297	496,536	147,159	7,157	392,700	543,017
2010	315,570	7,439	323,009	105,535	7,659	320,677	433,871
2011	278,291	9,109	287,400	108,710	20,610	333,920	463,240
2012	418,784	9,350	428,134	113,068	6,261	394,982	514,310
2013	386,272	6,874	393,146	111,372	7,804	359,367	478,543
2014	346,434	9,269	355,703	108,464	5,730	496,875	611,070
2015	378,532	9,022	387,554	235,040	3,097	437,258	675,395

Note: HS 2012 used at the 2-digit level  
 Source: Department of Treasury, Customs and Excise Tax Division; Star Kist Samoa; COS Samoa Packing; Office of Petroleum; Office of Procurement; U.S. Trade with Puerto Rico and U.S. Possessions (FT895) reports.



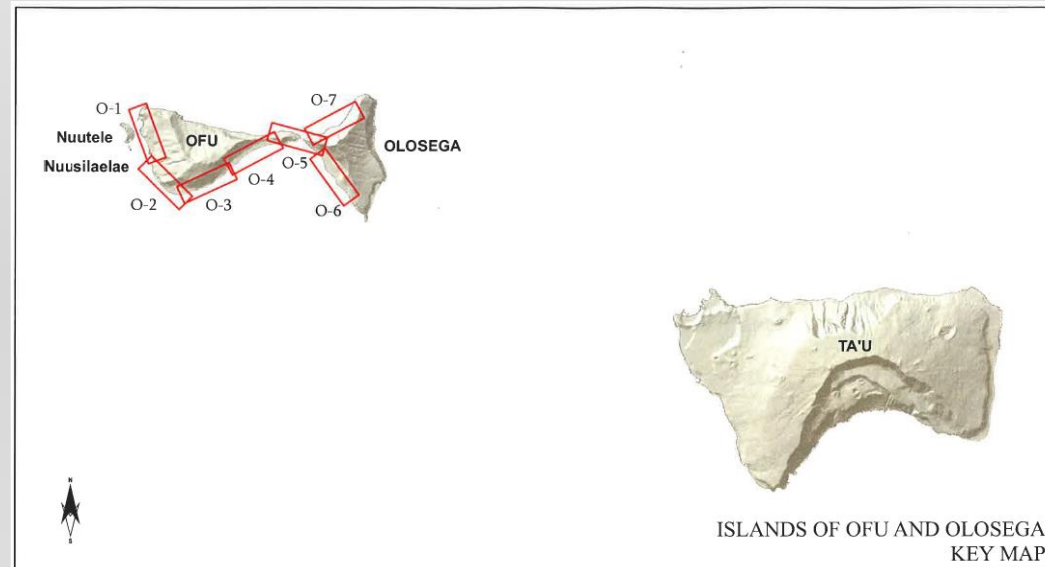
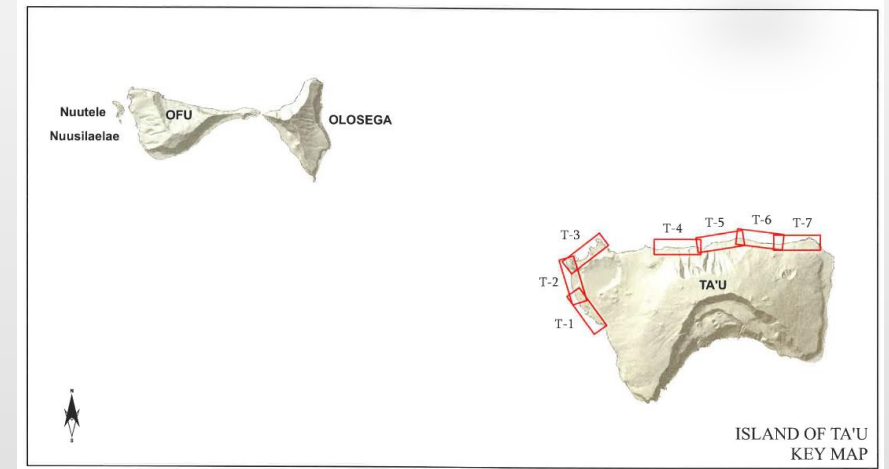
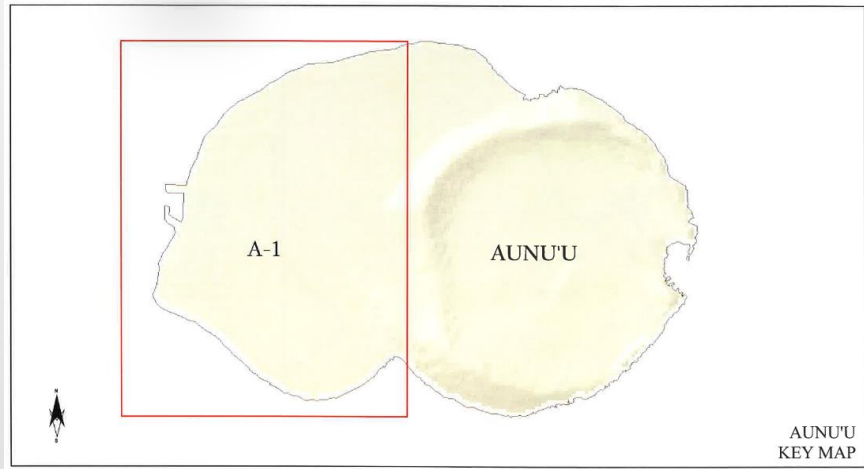
# Tutuila Island ACOE Shoreline Inventory - 2006







# Aunu'u, Ofu-Olosega and Ta'u Islands ACOE Shoreline Inventory - 2006





# Summary Shoreline Inventory ACOE Shoreline Inventory - 2006



## SUMMARY TABLE OF CRITICAL & POTENTIALLY CRITICAL EROSION IN EACH COASTAL SECTOR

The table below summarizes the findings of this study by comparing the length of shoreline classified as critical or potentially critical in each atlas page and coastal sector with the total length of coastline surveyed.

Coastal Sector	Critical (feet)	Potentially Critical (feet)	Non-Critical (feet)	Total Coastline (feet)
NS-1	139	828	2689	3656
NS-2	1074	503	6240	7817
NS-3	0	205	2835	3040
NS-4	131	879	4574	5584
NS-5	0	0	3739	3739
NS-6	0	305	3929	4234
<b>NS Total</b>	<b>1344</b>	<b>2720</b>	<b>24006</b>	<b>28070</b>
<b>NS Percentage</b>	<b>5</b>	<b>10</b>	<b>85</b>	<b>100</b>
NE-1	0	0	8031	8031
NE-2	781	687	1833	3301
NE-3	369	527	3315	4211
<b>NE Total</b>	<b>1150</b>	<b>1214</b>	<b>13179</b>	<b>15543</b>
<b>NE Percentage</b>	<b>7</b>	<b>8</b>	<b>85</b>	<b>100</b>
SE-1	531	543	6753	7827
SE-2	1532	1199	2955	5686
SE-3				
SE-4	1628	791	3107	5526
SE-5	4694	1677	384	6755
SE-6	3529	1867	2654	8050
SE-7	1858	1511	2192	5561
SE-8	1313	1644	1263	4220
<b>SE Total</b>	<b>15085</b>	<b>9232</b>	<b>19308</b>	<b>43625</b>
<b>SE Percentage</b>	<b>35</b>	<b>21</b>	<b>44</b>	<b>100</b>
PH-1	977	2027	3572	6576
PH-2	743	173	5830	6746
PH-3	2161	50	5167	7378
PH-4	0	0	6170	6170
PH-5	106	0	6345	6451
PH-6	352	433	5052	5837
PH-7	0	79	7344	7423
<b>PH Total</b>	<b>4339</b>	<b>2762</b>	<b>39480</b>	<b>46581</b>
<b>PH Percentage</b>	<b>9</b>	<b>6</b>	<b>85</b>	<b>100</b>
S-1	824	378	5997	7199
S-2	1608	935	2413	4956
S-3	1814	2423	1328	5565
S-3a	4896	255	390	5541
S-4	0	0	7979	7979
<b>S Total</b>	<b>9142</b>	<b>3991</b>	<b>18107</b>	<b>31240</b>
<b>S Percentage</b>	<b>29</b>	<b>13</b>	<b>58</b>	<b>100</b>

Coastal Sector	Critical (feet)	Potentially Critical (feet)	Non-Critical (feet)	Total Coastline (feet)
SC-1	665	589	9281	10535
<b>SC Total</b>	<b>665</b>	<b>589</b>	<b>9281</b>	<b>10535</b>
<b>SC Percentage</b>	<b>6</b>	<b>6</b>	<b>88</b>	<b>100</b>
SW-1	0	2221	3670	5891
SW-2	1335	1057	6654	9046
SW-3	3397	1405	880	5682
SW-4	736	1958	4430	7124
SW-5	341	839	2129	3309
<b>SW Total</b>	<b>5809</b>	<b>7480</b>	<b>17763</b>	<b>31052</b>
<b>SW Percentage</b>	<b>19</b>	<b>24</b>	<b>57</b>	<b>100</b>
W-1	164	815	2771	3750
W-2	0	0	2250	2250
<b>W Total</b>	<b>164</b>	<b>815</b>	<b>5021</b>	<b>6000</b>
<b>W Percentage</b>	<b>3</b>	<b>14</b>	<b>83</b>	<b>100</b>
Tutuila Total	37698	28803	146145	212646
<b>Tutuila Percentage</b>	<b>18</b>	<b>14</b>	<b>68</b>	<b>100</b>
A-1	0	384	7470	7854
<b>Aunu'u Total</b>	<b>0</b>	<b>384</b>	<b>7470</b>	<b>7854</b>
<b>Aunu'u Percentage</b>	<b>0</b>	<b>5</b>	<b>95</b>	<b>100</b>
O-1	814	1790	4789	7393
O-2	311	0	5713	6024
O-3	0	0	5024	5024
O-4	0	0	7716	7716
O-5	103	380	8657	9140
O-6	0	0	7673	7673
O-7	0	0	7626	7626
<b>Ofu Total</b>	<b>1228</b>	<b>2170</b>	<b>47198</b>	<b>50596</b>
<b>Ofu Percentage</b>	<b>2</b>	<b>4</b>	<b>94</b>	<b>100</b>
T-1	0	0	4837	4837
T-2	552	0	4017	4569
T-3	0	0	8618	8618
T-4	0	0	12420	12420
T-5	0	1924	10987	12911
T-6	1505	2573	1084	5162
T-7	696	1981	960	3637
<b>Ta'u Total</b>	<b>2753</b>	<b>6478</b>	<b>42923</b>	<b>52154</b>
<b>Ta'u Percentage</b>	<b>5</b>	<b>12</b>	<b>83</b>	<b>100</b>
<b>American Samoa Total</b>	<b>41679</b>	<b>37835</b>	<b>243736</b>	<b>323250</b>
<b>American Samoa Percentage</b>	<b>13</b>	<b>12</b>	<b>75</b>	<b>100</b>

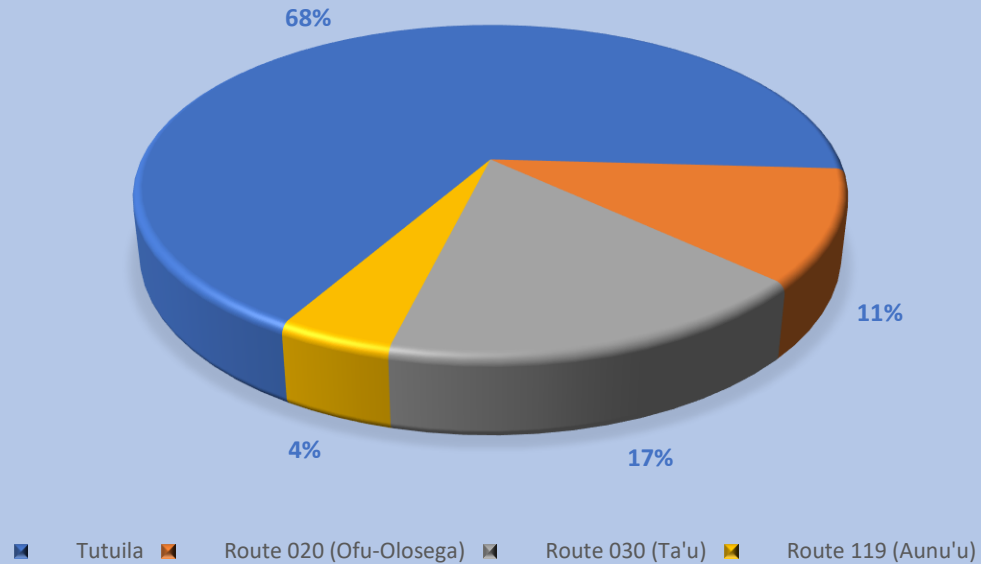




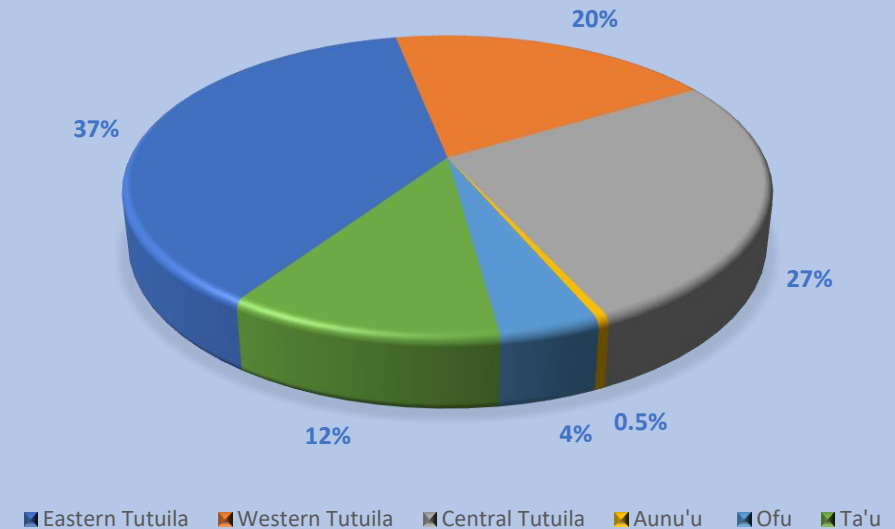
# Main Routes Susceptible to Sea Level Rise



ROUTES IN THE FHWA SYSTEM



AMERICAN SAMOA CRITICAL & POTENTIALLY CRITICAL COASTLINES



Routes in the System Susceptible to Damage	Length (Miles)
Tutuila	39.36
Route 020 (Ofu-Olosega)	6.41
Route 030 (Ta'u)	9.88
Route 119 (Aunu'u)	2.61
<b>Total Length</b>	<b>59.00</b>

	Critical (Miles)	Potentially (Miles)	Total (Miles)
Eastern Tutuila	3.30	2.34	5.64
Western Tutuila	1.26	1.68	2.94
Central Tutuila	2.58	1.44	4.02
Aunu'u	-	0.07	0.07
Ofu	3.38	0.41	3.79
Ta'u	0.52	1.23	1.75
<b>Total</b>	<b>11.04</b>	<b>7.17</b>	<b>18.21</b>

AMERICAN SAMOA TERRITORIAL HIGHWAY SYSTEM : 150 MILES

# SHORELINE PROTECTION PROJECT OBJECTIVES

- Protect Airport and Highway/Road Infrastructure from Coastal Erosion
- Improve resiliency in addressing Rising Sea Levels, Storms/Adverse Weather, Tsunami Inundation
- Minimize Safety Risks to Transportation
- Improve transportation safety and infrastructure reliability for the movement of people and cargo.
- To protect the coast against coastline retreat, thus protecting housing, critical infrastructure





# MANUA SHORELINE PROTECTION: Ofu Airport



- Protect Runway Safety Area, Airport Infrastructure from Coastal Erosion
- Combat rising sea levels, and tsunami inundation
- Minimize Safety Risks to aircraft operations
- Improve air transportation safety, and infrastructure reliability for the movement of people and cargo.
- Design/Engineering: \$500K
- Construction: \$2.5M







# Ofu-Olosega Location

Proposed Shoreline Protection				
Location		Length	Unit of Measure	Budget (\$000)
Route 020 – Ofu - Olosega from Ofu Airport to Ofu Wharf	=	8,480	linear Feet	
Unprotected Ofu Coastline		7,272	linear Feet	\$ 17,453.00







# Ofu-Olosega Bridge Location



LENGTH	= 300 LINEAR FT.
NO. LANES	= 2
COST	= \$125M



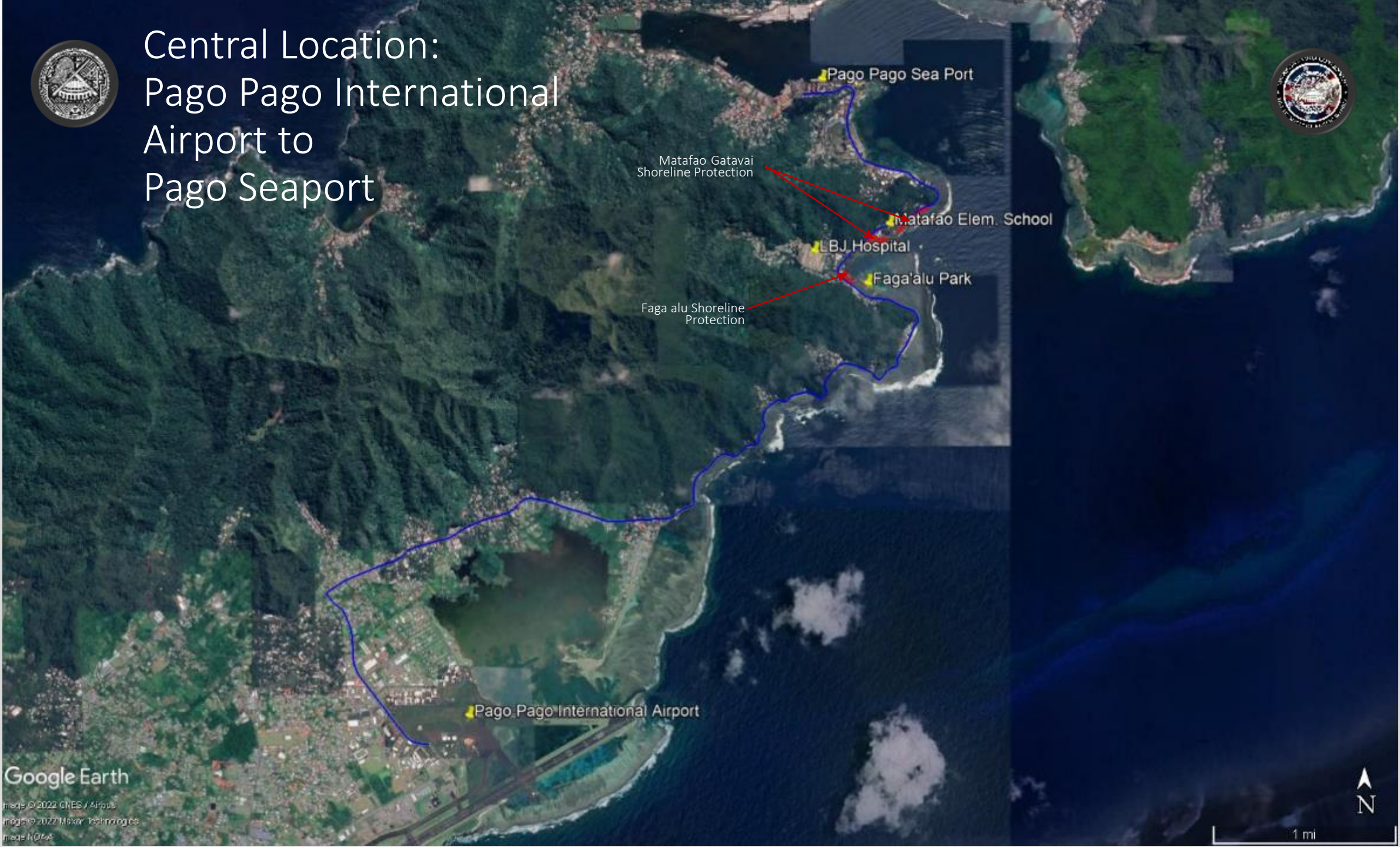
Google Earth

Delta SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image © 2022 Maxar Technologies  
Image © 2022 CNES / Airbus





# Central Location: Pago Pago International Airport to Pago Seaport



Google Earth

Image © 2022 CNES / Airbus  
Image © 2022 Maxar Technologies  
Image NOAA





# PAGO PAGO INTL AIRPORT / PALA LAGOON

- Address Rising Sea Levels
- Prevent Flooding of Runway
- Manage retreat of vegetation and land
- Design and Environmental Assessments: \$500K
- Construction: \$25M
- Approx: 4500ft





# Pago Pago Intl Airport

Runway Shoreline Protection

Coconut Point



Google Earth

Pago Pago Intl Airport



1000 ft





# Central Location: Faga'alu to Matafao



Existing Matafao Shoreline

Existing Matafao Shoreline

LBJ Hospital

Matafao Elem. School

Existing Faga'alu Shoreline

Faga'alu Park

Proposed Shoreline Protection			
Location	Length	Unit of Measure	Budget (\$000)
Route 001 – Main from Pago Pago International Airport to Pago Pago Sea Port	40,300	linear Feet	
Unprotected Shoreline:			
Faga'alu Shoreline	= 500	linear Feet	\$ 875.00
Matafao - Gatavai Shoreline	= 1,950	linear Feet	\$3,413.00







# Eastern Shoreline: Lauli'i to Auasi Wharf



Lauli'i Village Proposed  
Shoreline Protection

Auasi Wharf Proposed  
Shoreline Protection

Proposed Shoreline Protection				
Location		Length	Unit of Measure	Budget (\$000)
Route 001 – Laulii to Auasi (Current)	=	27,700	linear Feet	\$ 48,500.00

Google Earth

Image © 2022 Maxar Technologies  
Image © 2022 CNES / Airbus  
Image NOAA



1 mi





# Western Shoreline: Amaluia to Nua-Seetaga



Poloa Village Marine Protected Area

Rte 111

Paleg Beach

Rte 111

Nua Seetaga Proposed  
Shoreline Protection

Amaluia Proposed  
Shoreline Protection

Siona Le Maugā Park

Faasao Manū High School

Rte 111

Proposed Shoreline Protection			
Location	Length	Unit of Measure	Budget (\$000)
Route 001 – Laulii to Ausi (Current)	9,450	linear Feet	\$ 16,400.00





# PROJECT CHALLENGES

- Funding Availability
- Access to Technical Assistance
- Permitting Process
- Identifying the most effective shoreline stabilization/protection strategies to support the project
- Securing resources - quality raw materials (rock) for a RIP RAP





# Ex: Identifying the Most Effective Shoreline Protection: Ofu-Olosega Bridge



OFU: Bridge Landing



OLOSEGA: Bridge Landing







# FA'AFETAI TELE LAVA !



## QUESTIONS?

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