US VIRGIN ISLANDS REPETITIVE LOSS PROPERTIES STRATEGY

The United States Virgin Islands has formulated a strategy to effectively address the significant negative impact of Repetitive Loss properties on the Territory's families, economy and property. On June 30, 2004, the National Flood Insurance Act (42 U.S.C 4001 et seq) was amended to "introduce a mitigation plan requirement as a condition of receiving a reduced local cost share for the activities that mitigate severe repetitive loss properties under the Flood Mitigation Assistance and Severe Repetitive Loss grant programs. The October 31, 2007, interim final rule established this requirement under the 44 CFR § 201.4 (c)(3)(v) to allow a state to request the reduced costs share under the FMA and SRL programs if it has an approved State Mitigation Plan that also includes an approved Severe Repetitive Loss Strategy" (FEMA, Multi-Hazard Planning Guidance, 2008).

A Severe Repetitive Loss (SRL) property is defined as a residential property that is covered under an NFIP flood insurance policy and:

(a) That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
(b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart.

The primary objective of this strategy is to increase awareness of the negative impact of repetitive loss properties and the benefits of mitigation actions and to eliminate or reduce the total number of repetitive loss properties in the Territory.

Therefore, the Territory's approach is primarily focused on public education, data collection, and direct mitigation actions focused on minimizing repetitive losses. These are highlighted in the Plan Update in the following areas:

- Educational Outreach – where specific actions focus on developing an outreach program to provide the community with hazard mitigation educational materials include those on the NFIP, Community Rating System, as well as repetitive loss concerns. These outreach activities will educate citizens on the impact of repetitive loss properties in their communities and suggest ways to reduce flood insurance premiums. More specific programs will provide professionals and private sector guidance on retrofitting options and opportunities for repetitive loss properties (see programmatic action 2 and 3).
- Data Collection – where specific action is taken by VITEMA to collect important information for the implementation of island specific actions focused on minimizing losses in high priority repetitive loss properties. Programmatic Actions #5 is specifically focused toward this program and will help with the implementation of the specific projects.
- Annual Reporting – the collection of data will also facilitate plan implementation and monitoring highlighted in Section Six. Better data collection by VITEMA will facilitate more accurate reporting on the total number of repetitive loss properties that are either targeted or retrofitted by the Territory.

- Targeted Actions – There are a number of specific mitigation actions that seek to minimize flood related losses (see tables in section 5 on island-specific mitigation actions). Many of these projects involve drainage improvements but could also involve acquisitions, elevations, or other flood protection measures.

C.1 REPETITIVE LOSS PROPERTIES DATA

In preparation for this 2011 Plan Update, VITEMA requested data from FEMA regarding the identified Repetitive Loss (RL) and Severe Repetitive Loss (SRL) properties in the Territory. In March 2011, FEMA provided RL and SRL data as of November 2010, in the form of the RL and SRL assessment report completed for DR-1939. The table below shows the data received, which is the latest data available.

TABLE C.1 ***US Virgin Islands RL/SRL Property Statistics***

County	RLP Count	Percentage of RLP for USVI	SRLP Count	Insured Properties	Losses	Buildings Payment	Contents Payment	Total Paid	Percentage of Total USVI Payouts
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ST. JOHN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ST. THOMAS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TOTAL	247	100%	3	110	670	$ 11,705,682.65	$ 21,711,401.23	$ 33,417,083.88	100%

As of November 2010 there were two hundred and fifty (250) RL properties identified in the NFIP BureauNet data system, with total claims paid of $33.4 million over the last 30 years. However, of those 250 structures, 21 were identified as duplicate entries. In addition, 3 structures were found to have been mitigated by a flood control project using funds from FMA, and 1 was a vacant lot. Therefore, as a result of the field verification process the total amount of RL structures in the USVI has been decreased from 250 to 225. The following table illustrates the results of this field inspection survey.

Table C.2 ***RL/SRL Validated Properties, as a Result of Field Inspection Summary***

CITY, STATE	RLP	SRLP	Insured	Located	Unable to Locate	Pending Inspections	Duplicated	Mitigated	# Reports	TOTAL (internal: minus DUP & MIT)
St. Croix, USVI	133	3	72	104	21	0	11	2	125	123
St. John, USVI	2	0	1	2	0	0	0	0	2	2
St. Thomas, USVI	112	0	37	73	27	2	10	2	102	100
	247	3	110	179	48	2	21	4	229	225

While the data provided by FEMA is illustrative of the number of NFIP-insured properties that meet the definition of Repetitive Loss or Severe Repetitive Loss, the information has limited uses in the development and implementation of the Territory's SRL Strategy. Without specific addresses, it is difficult to develop a targeted strategy to address RL and SRL structures throughout the Territory. In addition, the FEMA-provided data is limited to only those structures which are NFIP-insured, which likely does not account for the majority of repetitive loss structures in the Territory, as many are not insured through the NFIP.

As a supplement to the data received from FEMA data, and in an effort to develop a strategy that will target all properties known to suffer repetitive loss, VITEMA has included information on areas and neighborhoods known to be prone to repetitive flood loss. These areas and neighborhoods were identified by VITEMA and the Department of Permitting and Natural Resources, by staff with knowledge of the nature, frequency and effects of repetitive flooding in the areas. Those areas and neighborhoods are identified below, and are organized by island.

TABLE C.3 ***VITEMA-Identified Repetitive Loss Areas or Neighborhoods***

Island	Area or Neighborhood	Type of Development	Description of Known Flooding Issues
St. Thomas	Charlotte Amalie Main Street Area	Primarily commercial area with historic structures and drainage	Flooding primarily results from storm surge and exceptionally high tide events - Some flooding caused by storm water runoff and inadequate drainage
	Turpentine Run area	Primarily commercial	Flooding caused by storm water runoff and inadequate drainage
	Nadir area	Residential, single-family structures	Flooding caused by storm water runoff and inadequate drainage
	Bovoni Area (Thomasville Community)	Residential, single- and multi-family structures	Flooding caused by storm water runoff and inadequate drainage
	Bolongo Bay area	Residential, single-family structures	Flooding caused by storm water runoff and inadequate drainage
	Smith Bay area	Mixed use (residential and commercial)	Flooding caused by storm water runoff and inadequate drainage
	St. Peter area	Residential, single-family structures	Flooding caused by storm water runoff and inadequate drainage
St. Croix	Gallows Bay / Spring Valley area	Mixed use (residential and commercial)	Sheet flow flooding caused by storm water runoff and inadequate drainage
	La Grand Princess area	Mixed use (residential and hotel)	Flooding caused by storm surge, storm water runoff and inadequate drainage
	Sion Hill area	Mixed use (largely residential, come commercial)	Flooding caused by storm water runoff and inadequate drainage
	Estate Castle area	Mixed use (residential and commercial)	Flooding caused by storm water runoff and inadequate drainage
	Estate Barren Spots area (includes Strawberry Estate, Strawberry Hill, Estate La Reine)	Mixed use (residential and commercial)	Flooding caused by storm water runoff and inadequate drainage
	Mon Bijou area	Residential, single-family structures	Flooding caused by storm water runoff and inadequate drainage; significant erosion in the gut
	Lorraine Village Apartments area	Residential, single- and multi-family structures	Flooding caused by storm water runoff and inadequate drainage; significant erosion in the gut

Island	Area or Neighborhood	Type of Development	Description of Known Flooding Issues
	William's Delight area	Residential, single-family structures	Flooding caused by storm water runoff and inadequate drainage
	Fredericksted area	Mixed use (residential and commercial) with historic structures and drainage	Flooding caused by storm water runoff and inadequate drainage from upstream sources
St. John	Cruz Bay area	Mixed use (residential and commercial)	Flooding caused primarily by storm surge, with some storm water runoff issues
	Coral Bay area	Mixed use (residential and commercial)	Flooding caused primarily by storm surge, with some storm water runoff issues

This strategy will focus on these VITEMA-identified areas or neighborhoods, while remaining mindful of the two hundred and twenty-five NFIP-insured properties that provide a significant drain on the National Flood Insurance Fund.

C.2 REPETITIVE LOSS PROPERTIES MITIGATION PROJECT TYPES

A variety of project types exist that have the potential to mitigate repetitive flood losses. This sub-section provides a general discussion of these project types. Specific recommendations to address repetitive losses in specific areas can be found later in this section.

Public Education and Outreach
Insurance industry and emergency management research has demonstrated that awareness of hazards is not enough. People must know how to prepare for, respond to, and take preventive measures against threats from hazards. This research has also shown that a properly run local information program is more effective than national advertising or public campaigns.

Although Territorial efforts to inform the public exist, lives and properties continue to be threatened when segments of the population remain uninformed or chose to ignore the information available. Public education and outreach serves to assist communities with problems experienced from repetitive flooding. Educating the public of these life and property saving techniques should be a high priority task for all levels of government.

National Flood Insurance Program, Floodplain Management, and Building Codes
Improved floodplain management, including land use planning, zoning, and enforcement in the Territory can reduce flood related damages for both existing buildings and new development. The use of the NFIP is critical to the reduction of future, repetitive flood damage costs to the taxpayer.

All developments, regardless of the location, require a permit to include buildings, fill, and any other type development. The Territory has the authority to implement and enforce adopted ordinances related to floodplain management, building code and zoning compliance.

The NFIP requires that when the cost of reconstruction, rehabilitation, addition, or other improvements to a building equals or exceeds 50% of the fair market value, then the building must meet the same construction requirements as a new building. Substantially damaged buildings must be brought up to new construction standards. A residence or building damaged so that the cost of repairs equals or exceeds 50% of the

structure's fair market value must also be elevated above the Base Flood Elevation (BFE) in flood zones where BFEs are established. This provision applies to the entire jurisdiction of the Territory.

The current, effective Flood Insurance Rate Maps for the Territory were issued on April 16, 2007. The Territory joined the NFIP on October 15, 1980, and is a member community in good standing with the Program.

Within floodplain management as a whole, the education process must play an important role. As noted above, an effective education program should be implemented to show citizens the importance of building codes and ordinances and how cost effective they could be in reducing future damages.

Established through the NFIP, the Community Rating System (CRS) is a program that participants can elect to join. Once a community has joined, policy holders in participating communities receive a discount on their flood insurance premiums. As a result of being part of the CRS, the Territory would have to actively pursue public outreach programs. One of the requirements of CRS is an annual outreach project, such as a Repetitive Loss Outreach Program. This program would focus on repetitive loss areas within the Territory and consists of three main components. The first is to advise the homeowners that they live in a repetitive loss area and could be subject to flooding. The second is to give the property owner appropriate property protection measure guidelines. The third is to make the homeowner aware of the basic facts about Flood Insurance. The Territory is not currently a member of the CRS, but could consider joining the program in the future.

Each community that is a participating community in the NFIP Program is required to have both a well trained municipal floodplain manager and construction code official. The Territory currently meets this requirement. To ensure adequate enforcement of both codes, each community in the NFIP should encourage additional training opportunities for all code enforcement personnel, to include its floodplain manager.

Floodplain management and building codes serve to assist the communities with problems experienced from floods, hurricanes, tornadoes, and thunderstorms/lightning/high winds as well as other lower priority hazards.

The Territory has adopted and currently enforces the International Building Code (IBC), 2009.

Flood Mitigation Actions

Retrofitting structures prone to periodic flooding can be an effective mitigation technique to reduce the flood loss of property. Techniques include the elevation of structures, property acquisition, dry flood-proofing, wet flood-proofing, and drainage improvements. Each of these project types is discussed below.

Elevation: involves raising a structure on a new foundation so that the lowest floor is above the BFE. Almost any type and size of structure can be elevated, though some types of construction lend themselves more easily to this technique.

A secondary type of elevation is known as a *second-story conversion.* In this type of elevation project, the first or ground floor of a structure is demolished, and a new floor is constructed above the BFE. In the case of an existing 2 story structure, for example, the ground story would be removed, and a new story would be constructed above or on top of the previous second story. This allows for the entire structure to be elevated above the BFE, without causing the structure the strain of traditional elevation.

Acquisition of Structures: the *buyout* option is the most effective mitigation technique to reduce the loss of property due to flooding. The owners of repetitive flood loss or flood damaged structures sell their structure and property to the community on a cost share basis for the fair market value of the structure prior to the last flood event. The structure is removed and/or demolished, and a deed restriction is placed on the property for perpetuity, thus removing the structure from future flood damage. This approach is most effective when flood prone structures located within the same vicinity are grouped together and acquired. The remaining property is converted to open space, and is subject to the building and development limitations outlined in the deed restriction. While the property may be re-developed, it may not be in any manner that impedes the floodplain or violates the terms of the deed restriction.

Dry Flood-proofing: is a mitigation technique designed to prevent floodwaters from penetrating the structure. Techniques include the building of floodwalls adjacent to existing walls, the installation of special doors to seal out floodwaters, and special backflow valves for water and sewer lines. Dry flood-proofing includes low cost mitigation measures such as raising air conditioners, cisterns, and water heaters on platforms above the BFE.

Wet Flood-proofing: is a mitigation technique designed to allow for the safe entry of floodwaters into a structure, thereby minimizing the flood damage to the structure. Generally, this includes properly anchoring the structure, using flood resistant materials below the BFE, protection of mechanical and utility equipment, and use of openings or breakaway walls. Application of wet flood-proofing as a flood protection technique under the NFIP is limited to enclosures below elevated residential and non-residential structures and to accessory and agricultural structures that have been issued variances by the community.

Drainage Improvements: Improving the drainage capacity around roads and low-lying areas is a time-tested technique to mitigate flood damage. Maintenance of drainage canals, swales, ditches, culverts and laterals is essential to maximize their efficiency and continued long term effectiveness. General actions to reduce the effects of flooding include: widening and deepening the canals, cleaning of existing ditches, replacing existing culverts, upgrading pumps, installing check valves and inverts in certain culverts. Maintaining and improving drainage serves to assist the communities with problems experienced from floods, high winds, and severe storms.

Erosion Mitigation Actions
With a clear understanding of the erosion hazard, communities can work towards preventing future damages. Some mitigating measures are:

- **Educational Outreach:** develop and conduct educational outreach programs on the effects of coastal erosion as well as on how to minimize future erosion.
- **Erosion Zone Studies**: conduct detailed studies to identify erosion hazard zones and provide direction for future coastal development.
- **Erosion Control / Bank Stabilization:** detailed studies of eroded or erosion-prone areas can provide direction for ways to slow down erosion rates or to otherwise provide for bank stabilization.
- **Beach Restoration** projects can also be undertaken as a means to mitigate this hazard, when erosion occurs in shoreline or beachfront areas.

C.3 POTENTIAL FUNDING SOURCES

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP), and the Unified Hazard Mitigation Assistance (UHMA) grant program. The UHMA includes the Flood Mitigation Assistance Program (FMA), the Hazard Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation Program (PDM), Repetitive Flood Claims (RFC) and the Severe Repetitive Loss (SRL) grants. All of these programs are administered by VITEMA.

The following is a tabular summary, followed by a more detailed description of programs that are the primary source of federal funding of hazard mitigation projects and activities in the USVI. All of the programs listed below are current or potential sources funding for mitigation projects to address Severe Repetitive Loss properties and concerns.

TABLE C.4 ***Federally Funded Mitigation Programs***

Program	Type of Assistance	Availability	Funding Source
National Flood Insurance Program (NFIP)	Pre-disaster flood insurance	Any time (pre and post disaster)	National Flood Insurance Program
Flood Mitigation Assistance Program (FMA)	Cost share grants for pre-disaster planning and flood projects	Annual pre-disaster grant program	FEMA
Hazard Mitigation Grant Program (HMGP)	Post-disaster cost share grants	Post disaster grant program	FEMA
Pre-Disaster Mitigation Program (PDM)	Pre disaster mitigation grants	Annual pre-disaster grant program	FEMA
Repetitive Flood Claims (RFC)	Pre disaster flood mitigation grants, targeting Repetitive Loss properties	Annual pre-disaster grant program	FEMA
Severe Repetitive Loss (SRL)	Grants for flood mitigation, targeting properties identified as Severe Repetitive Loss	Annual pre-disaster grant program	FEMA
Public Assistance	Post-disaster aid to state and local governments	Post disaster	FEMA
Community Development Block Grant- Disaster Recovery Funding (CDBG-DR)	Post disaster aid to state and local governments	Post disaster	U.S. Department of Housing and Urban Development

The following paragraphs provide additional details regarding these Federal mitigation funding opportunities. Each of these programs is a potential funding source for projects to advance VITEMA's SRL strategy.

National Flood Insurance Program

The National Flood Insurance Program (NFIP), established by Congress in 1968, provides flood insurance to property owners in participating communities. This program is a direct agreement between the federal government and the Territory that flood insurance will be made available to residents in exchange for community compliance with minimum floodplain management requirements. Since the typical property insurance policy does not cover flooding, the Terriotry's participation in the NFIP is vital to protecting property in the floodplain as well as ensuring that federally backed mortgages and loans can be used to finance property within the floodplain.

Pursuant to the Flood Disaster Protection Act of 1973, many forms of federal financial assistance, including disaster assistance and federally regulated loans, related to structures located in the Special Flood Hazard Area (SFHA) are contingent on the purchase of flood insurance. Such federal assistance includes not only direct aid from agencies, but also from federally insured lending institutions. In order for property owners to be eligible for purchasing flood insurance through the federal government, their respective community must be participating in good standing in the NFIP.

Communities participating in the NFIP must:

. Adopt the Flood Insurance Rate Maps as an overlay regulatory district or through another enforceable measure.
. Require that all new construction or substantial improvements to existing structures in the flood hazard area will be compliant with the construction standards of the NFIP and adopted building code.
. Require additional design techniques to minimize flood damage for structures being built in high hazard areas, such as floodways or velocity zones.

Flood Mitigation Assistance Program (FMA)

Authorized by the National Flood Insurance Reform Act of 1994 (42 USC 4101, the Flood Mitigation Assistance (FMA) program was created with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP).

FEMA provides FMA funds in the form of a grant to assist the Territory in the implementation of measures that reduce or eliminate the long-term risk of damage to buildings and structures insured under the NFIP. Three types of grants are available to the Territory:

- **Planning Grants** to prepare Flood Mitigation Plans. Only NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA Project grants
- **Project Grants** to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. Applicants are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978.
- **Management Cost Grants** for the Territory to help administer the FMA program and activities. Up to ten percent (10%) of Project grants may be awarded for Management Cost Grants

Flood hazard mitigation plans, approved by the Territory and FEMA, are a pre-requisite for receiving FMA project grants. FEMA provides a federal share of up to 75% of the cost of the plan or project while the remaining 25% must come from a non-federal funding source.

FMA is funded through an annual federal appropriation. In Fiscal Year 2010 (FY-10), approximately $32,308,500 was allocated to FMA nationwide. . Previous fiscal years have seen FMA allocations ranging from $28,000,000 to $35,700.000 nationwide.

Some statutory limits exist on the amount of FMA funding a State may receive[1]:

- The total amount of FMA funds provided during any 5-year period shall not exceed $10 million to any State agency or $3.3 million to any community.
- The total amount of FMA funds provided to any State, including all communities located in the State, shall not exceed $20 million during any 5-year period.
- Individual planning grants using FMA funds shall not exceed $150,000 to any Applicant or $50,000 to any sub-applicant. FMA funds only can be used for the flood hazard component of a hazard mitigation plan that meets the planning criteria outlined in 44 CFR Part 201.
- The total planning grant using FMA funds made in any fiscal year to any State and the communities located within the State shall not exceed $300,000.
- No more than 7.5 percent of FMA funds shall be used for planning in any fiscal year.
- A planning grant shall not be awarded to an applicant or sub-applicant more than once every 5 years.

Applicants for FMA funding must submit their applications through the e-Grants system during the application window, as established by the *HMA Unified Guidance.* For FMA, FEMA will conduct a National Technical Review, for all project sub-applications that are forwarded from the initial FEMA review, for the following:

- Cost effectiveness;
- Engineering feasibility and effectiveness; and
- Environmental and Historic Preservation compliance.

Hazard Mitigation Grant Program (HMGP)

Unlike the other HMA programs, HMGP is not a nationwide competitive program. Established pursuant to Section 404 of the Stafford Disaster Relief and Emergency Relief Act (PL 100-707), this program provides matching grants (75% Federal, 25% non Federal) for FEMA-approved hazard mitigation projects following a Presidential Disaster Declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from

[1] Note: FEMA may waive the above limits when a major flood-related disaster or emergency is declared pursuant to the Stafford Act.

a disaster. Eligible State, Territorial, local and tribal governments, as well as some non-profit organizations, may apply for the funding. Individual citizens are not eligible to apply, though eligible entities may apply on their behalf.

HMGP is not funded annually. The amount of funding available varies from disaster to disaster. The formula is based on the estimated aggregate grant funding under the Stafford Act assistance programs (Public Assistance, Individual Assistance, and Disaster Unemployment Assistance). The Territory is allocated a percentage of the estimated funding for use as HMGP funds. States and Territories with Standard Mitigation Plans, such as Rhode Island, are allocated the following:

15 % of the first $2,000,000,000
10% of the next $10,000,000,000
7.5% of any amount over $10,000,000,000

For States and Territories with a Standard Mitigation Plan, the total allocation for HMGP cannot exceed $35,333,000,000.

States and Territories with an Enhanced Mitigation Plan are eligible to receive an amount not to exceed 20% of the estimated aggregate grant funding.

The grants are specifically directed toward reducing future hazard losses, and can be used for projects protecting property and other resources against the damaging effects of floods, hurricanes, earthquakes, high winds, and other natural hazards.

Since the creation of the HMA program, significant changes have been made to the program guidance that guides the HMGP. The following illustrates the program guidance for HMGP in recent years:

- For disasters declared prior to 06-01-09, the 1999 *HMGP Desk Reference* is the applicable guidance.
- For disasters declared on or after 06-01-09 and prior to 06-01-10, the *FY-10 HMA Unified Guidance* is the applicable guidance.
- For disasters declared on or after 06-01-10, the *FY-11 HMA Unified Guidance* is the applicable guidance.

In addition to these changes, FEMA also implemented guidance specific to property acquisition projects. FEMA codified Part 80, *Property Acquisition and Relocation for Open Space,* into 44 CFR; the new part became effective for all disasters declared on or after 12-03-07.

Pre-Disaster Mitigation Competitive (PDM) Program

The Pre-Disaster Mitigation (PDM) Program was authorized by §203 of the Robert T. Stafford Disaster Assistance and Emergency Relief Act (Stafford Act), 42 US.C. Chapter 68, as amended by § 1 02 of the Disaster Mitigation Act of 2000. Funding for the program is provided by annual appropriation through the National Pre-Disaster Mitigation Fund to assist States, Territories, Indian Tribal Governments, communities

and universities in implementing cost effective hazard mitigation activities that complement a comprehensive mitigation program. All applicants must be participating and in good standing in the National Flood Insurance Program (NFIP) if they have been identified through the NFIP as having a Special Flood Hazard Area.

44 CFR Part 201, *Hazard Mitigation Planning*, establishes criteria for State, Territorial and local hazard mitigation planning authorized by §322 of the Stafford Act, as amended by §104 of the DMA 2000. After November 1, 2004, states and territories are required to have an approved mitigation plan in order to receive PDM funds for State or Territorial mitigation projects. Therefore, the development and maintenance of State or Territorial mitigation plans is critical to maintaining eligibility for future PDM funding.

Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds.

PDM is a part of FEMA HMA Program, and is guided by the *HMA Unified Guidance* for the applicable fiscal year.

The State or Territory (also called the Applicant) submits the prioritized applications to their FEMA Regional Office. Applications will be initially reviewed by FEMA to ensure all minimum requirements are met for the PDM program. FEMA provides additional ranking points for all eligible mitigation planning and project sub-applications on the basis of predetermined, objective, quantitative factors to calculate a final National Ranking Score for each sub-application.

The table below provides the 2011 National Ranking Factors.

National Ranking Factors and Point Values	Plans	Projects
The priority given to the sub-application by the Applicant in their PDM grant application.	40%	40%
Assessment of frequency and severity of hazards.	20%	NA
Whether the Applicant has a FEMA-approved Enhanced State / Tribal Mitigation Plan by the application deadline.	20%	20%
Community mitigation factors such as Community Rating System class, Cooperating Technical Partner, participation as a FireWise Community, and adoption and enforcement of codes including the International Code Series and National fire Protection Association 5000 Code, as measured by the Building Code Effectiveness Grading Schedule.	10%	10%
The percent of the population benefitting, which equals the number of individuals directly benefiting divided by the community population.	NA	10%
Whether the project protects critical facilities.	NA	10%
Status of the local sub-applicant as a small and impoverished community.	10%	10%
TOTAL POINT VALUES	100%	100%

Project and plan applications that are selected for further review are sent for final review by the National Evaluation Panel. These are panels composed of representatives from FEMA, State, Territories, local governments, federally recognized Indian Tribal governments, and other Federal agencies who peer evaluate project and planning sub-applications on the basis of qualitative factors. (Note: Project applications and Plan applications have differing factors, which can be found here: http://www.fema.gov/government/grant/pdm/index.shtm.)

PDM, unlike other HMA programs, is a nationwide, competitive program. While there is no set limit on how much funding a single State, Territory or community may receive, there are restrictions in place, which are as follows:

- Up to $800,000 Federal share may be requested in a sub-application for a planning grant to develop a new hazard mitigation plan.
- Up to $400,000 Federal share may be requested in a sub-application for a planning grant to update a hazard mitigation plan.
- Up to $3 million Federal share may be requested in a sub-application to implement a mitigation project.
- The cumulative Federal award for sub-applications awarded during a single application cycle to any one Applicant shall not exceed 15 percent of the total appropriated PDM program funds for that application cycle.

The amount of funding allocated for PDM fluctuates from year to year:

FY-10	$100,000,000
FY-09	$ 90,000,000
FY-08	$114,000,000
FY-07	$100,000,000
FY-06	$ 50,000,000

Repetitive Flood Claims (RFC) Program

The Repetitive Flood Claims (RFC) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108–264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). The goal of the RFC program is the reduction of flood damages to individual properties for which one or more claim payments for losses have been made under flood insurance coverage and that will result in the greatest savings to the National Flood Insurance Fund (NFIF) in the shortest period of time.

An application may be submitted for RFC funding if neither the Applicant nor the sub-applicant can currently meet the FMA non-Federal share requirement. FEMA may contribute up to 100% of the project cost. The Application and the sub-application must include certification (e.g., signed letter from an authorized local government official) explaining why the FMA cost-sharing requirement cannot be met. If a project to mitigate this particular property was previously identified on a sub-application for HMA funding and the project was

not funded, the Applicant or sub-applicant must explain why the 25% non-Federal cost share is no longer available for this project.

Up to $10 million is available annually for FEMA to provide RFC funds to assist States, Territories and communities reduce flood damages to insured properties that have had one or more claims to the National Flood Insurance Program (NFIP). This amount has been stable since the program's inception in FY-06. Funding for minor localized flood reduction projects is restricted to a maximum of $1 million; no other funding restrictions are currently in place.

Communities seeking RFC funding must be members of the NFIP in good standing. Applications are made through FEMA's e-Grants system, and must be made during the established application cycle. For RFC, FEMA will conduct a National Technical Review, for all project sub-applications that are forwarded from the initial FEMA review, for the following:

- Cost effectiveness;
- Engineering feasibility and effectiveness; and
- Environmental and Historic Preservation compliance.

Severe Repetitive Loss (SRL) Program

The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act of 1968 to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss (SRL) structures insured under the National Flood Insurance Program (NFIP).

Definition: The definition of severe repetitive loss as applied to this program was established in section 1361A of the National Flood Insurance Act, as amended (NFIA), 42 U.S.C. 4102a. An SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

(a) That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or

(b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart.

Note: Eligible costs for mitigation reconstruction projects funded under SRL are limited to $150,000 Federal share per property (excluding administrative allowances and permitting fees). In some cases, the percentage of non-Federal funds may exceed 25% in order to cover total project costs.

The SRL program differs from other FEMA mitigation grant programs in that those property owners who decline offers of mitigation assistance will be subject to increases to their insurance premium rates. Furthermore, prior to submitting a grant application to FEMA, Applicants and sub-applicants must consult, to the extent practicable, with the property owner to select the most appropriate project type for that property to

meet all programmatic, State, and local requirements. Any mitigation offer made under the SRL program remains open and available to the property owner as long as the SRL program exists, subject to the availability of funds. In the event that the property owner does not accept a mitigation offer, the property owner may appeal the insurance premium rate increase under certain conditions.

Communities seeking SRL funding must be members of the NFIP in good standing. Applications are made through FEMA's e-Grants system, and must be made during the established application cycle. For SRL, FEMA will conduct a National Technical Review, for all project sub-applications that are forwarded from the initial FEMA review, for the following:

- Cost effectiveness;
- Engineering feasibility and effectiveness; and
- Environmental and Historic Preservation compliance.

The amount of funding allocated for SRL fluctuates from year to year as well:

FY-10	$70,000,000
FY-09	$70,000,000
FY-08	$704,000,000
FY-07	$40,000,000
FY-06	$40,000,000

Public Assistance Program (Section 406 Mitigation)

The objective of the Federal Emergency Management Agency's (FEMA) Public Assistance (PA) Grant Program is to provide assistance to State, Territorial, Tribal and local governments, and certain types of private non-profit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President.

Through the PA Program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain private non-profit (PNP) organizations. The PA Program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process.

The Federal share of assistance is not less than 75% of the eligible cost for emergency measures and permanent restoration. The grantee (usually the Territory) determines how the non-Federal share (up to 25%) is split with the sub-grantees (eligible applicants).

After a natural or man-made event that causes extensive damage, FEMA coordinates with the Territory to implement the Public Assistance Grant Program. The funding process consists of the following steps:

- Preliminary Damage Assessment (PDA)
- Presidential Disaster Declaration
- Applicants' Briefing by Grantee
- Submission of Request for Public Assistance by Applicant

- Kick-off Meeting with Public Assistance Coordinator (PAC)
- Project Formulation and Cost Estimating
- Project Review and Validation
- Obligation of Federal Funds and Disbursement to Sub-grantees
- Appeals and Closeout

The Public Assistance (PA) Program is administered through a coordinated effort between the Federal Emergency Management Agency (FEMA), the Territory (grantee), and the applicants (sub-grantees).

The Robert T. Stafford Disaster Relief and Emergency Assistance Act provides FEMA the authority to fund the restoration of eligible facilities that have sustained damage due to a Presidentially declared disaster. Commonly called Section 406 Mitigation, this program provides some mitigation funding within the context of the Public Assistance Program.

Section 406 Mitigation provides discretionary authority to fund mitigation measures in conjunction with the repair of the disaster-damaged facilities. These opportunities usually present themselves during the repair efforts. The mitigation measures must be related to eligible disaster-related damages and must directly reduce the potential of future, similar disaster damages to the eligible facility. Normally, this work is performed on the parts of the facility that were actually damaged by the disaster. In some instances, an eligible mitigation measure may not be an integral part of the damaged facility.

There is no pre-set limit to the amount of Section 406 funds a community may receive. Section 406 Mitigation measures must be determined to be cost effective. Any one of the following means may be used to determine cost-effectiveness:

1. Mitigation measures may amount to up to 15% of the total eligible cost of the eligible repair work on a particular project.
2. Certain mitigation measures have been determined to be cost effective, as long as the mitigation measure does not exceed 100% of the eligible cost of the eligible repair work on the project.
3. For measures that exceed the above costs, the Grantee or sub-grantee must demonstrate through an acceptable benefit/cost analysis methodology that the measure is cost effective.

C.4 REPETITIVE LOSS PROPERTIES MITIGATION STRATEGIES

This sub-section provides specific mitigation strategy recommendations and suggestions for the VITEMA- and DPNR-identified repetitive loss areas throughout the Territory. A discussion of the area suffering repetitive flood damage is included, to provide a basis for the recommendations and suggestions.

In lieu of property-specific information from FEMA, this strategy was prepared based on local knowledge regarding areas of repetitive flood loss. Staff members from the Department of Permitting and Natural Resources (DPNR) Permitting Department and VITEMA were consulted, and a list of areas or neighborhoods known to be affected by repetitive flood loss was prepared. Each of these areas was then visited and assessed, in preparation for the development of this strategy.

It must be noted that the following strategies are recommendations only. No site-specific engineering or design has been conducted, nor has a detailed hydrology and hydraulic study been prepared. Prior to implementation of any of these recommendations, detailed engineering and analysis must occur.

For an overview of the areas designated as repetitive loss through this methodology, please refer to Table D-3.

Area-Specific Repetitive Loss Mitigation Strategies – St. Thomas

Charlotte Amalie: Main Street Area

This area is located in the heart of Charlotte Amalie, and is primarily comprised of commercial structures. Many of these structures are historic. The primary source of flooding is storm surge, though storm water runoff issues do exist. The runoff issues result from debris and/or inadequate drainage, in the form of undersized guts. The area has also been known to flood during exceptionally high tide events. During storm surge events, the flooding occurs, on average, inland as far as two streets back from the waterfront. The buildings in the area are predominantly slab on grade construction with no or little structure elevation for flood protection, though some exists to account for uneven terrain

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Wet flood-proofing of existing structures
- Dry flood-proofing of historic structures
- Drainage improvements

Turpentine Run Area

This mostly commercial area is located outside of Charlotte Amalie. Flooding occurs due to inadequate drainage from storm water runoff, usually from overtopping of a large gut along the roadway. When the gut overflows, the road and businesses suffer flood damage. The structures in the area date mostly to 1990s; none are considered historically significant. While other access points to the area do exist, the road that floods is the main thoroughfare.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Elevation of existing structures
- Wet flood-proofing of existing structures
- Drainage improvements

Nadir Area

This residential area is home to 70-80 single family structures, primarily consisting of slab on grade construction. Shallow, roadside guts provide the only drainage for storm water runoff, which is the source of flooding in this area.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Elevation of existing structures
- Wet flood-proofing of existing structures
- Drainage improvements

Bovoni Area

The residential community of Thomasville, in the Bovoni area, has storm water runoff issues similar to those found in the Nadir area. Though the Bovoni/Thomasville area is a bit hillier, the same inadequate drainage – comprised of shallow, roadside guts – is found in this neighborhood of 50-60 single family structures and an apartment community. Though the apartment community has been known to experience flooding, the single family structures were identified as the repetitive loss area.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Elevation of existing structures
- Wet flood-proofing of existing structures
- Drainage improvements

Bolongo Bay Area

This residential area is found in rather hilly terrain. The source of flooding for this area is storm water runoff, which results in frequent flooding of the roadway. One single family residential structure, located close to the road, is especially prone to flooding. Storm water runoff flows down the hill and along the road, resulting in too great of a flow for the small gut along the roadway to effectively contain.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Elevation of existing structures
- Wet flood-proofing of existing structures
- Drainage improvements

Smith Bay Area
This area is comprised of mixed use structures, with the primary flooding concern being for the residential structures. The entire area is flood-prone, as the small, inconsistent gut along the roadway provides insufficient drainage for storm water runoff, resulting in channeling of runoff along the roadway. The structures of particular concern are the 10-15 houses that are sited lower than the roadway, and are are especially prone to flooding.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Elevation of existing structures
- Wet flood-proofing of existing structures
- Drainage improvements

St. Peter/Northside Village Area:
In this hilly, residential area, there is a single family structure that is known to have suffered repetitive flood losses. A small gut along the road provides only drainage for storm water runoff, and is inadequate to contain the flow of water. Floodwaters spill out of the gut and cross the road, rushing over/under the guardrail and inundating the structure.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Wet flood-proofing of existing structures
- Drainage improvements

Area-Specific Repetitive Loss Mitigation Strategies – St. Croix

Gallows Bay/Spring Valley Area
This mixed use area is comprised of residential structures on top of the hills and commercial properties below the houses. The source of flooding in the area is storm water runoff, with sheet flow occurring down the hill. The flow typically channels through the street, and often enters the open sewer system under the street, leading to contamination issues. Due to the relative flatness of the road, flood waters typically stand for a day, disrupting passage and access to the ferry. In addition, new bypass highway is being constructed; this new highway will also use the existing drainage system.

To mitigate this repetitive loss area, the following strategy is recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Drainage improvements

La Grand Princess Area

This residential area has long-standing flooding issues, dating back more than 30 years. Development of the 200-300 affected homes this area was completed prior to the development of many areas upstream. Many of the structures in the area are of slab on grade construction, though some have been elevated for flood protection. Due to inadequate drainage for storm water runoff, flood waters funnel down the road to the beach. Throughout the area, structures bear visible signs of repetitive high water, with evident high water marks on structures. Many of the homes were built on filled foundations. In particular, one structure, located next to a gut, has experienced repetitive flooding so often that the house now has evident structural issues, including cracking of walls and foundation.

In addition, the area experiences storm surge flooding during tropical storm and hurricane events. In particular, the Hibiscus Hotel, a beachfront property, has made several insurance claims in the last few years, with damages resulting from storm surge. It should be noted that there are no dunes on the beach to provide flood protection, though a small sea wall (approximately 6' high) was constructed at edge of property.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Elevation of existing structures
- Wet flood-proofing of existing structures
- Drainage improvements

Sion Hill Area

This area is mixed use, but is largely comprised of residential structures. A major gut exists in the area, which provides drainage for storm water runoff. The road is higher than the gut, which results in flooding of the gut. Previous attempts to correct the issue have resulted in increased flooding. Some residents have erected small flood barriers around their property (often attached to fences around the property), causing increased flooding downstream. In previous flood events, water has moved throughout the area with enough force to dislodge a septic system.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Elevation of existing structures
- Wet flood-proofing of existing structures
- Drainage improvements

Estate Castle Area

This residential area experiences major flooding from a development upstream, and is often saturated with storm water runoff. Many of the approximately 100 homes in the area were constructed below grade. The area is prone to standing water in the road, as evidenced by the large and numerous potholes. Just to the east of the area are several acres of impervious surface, which results in a fast moving sheet flow of flood waters. Property owners and residents have been trapped in their houses and/or had no access to egress. A retention pond was placed in the area to alleviate some of the drainage issues, but – due to poor maintenance - it was eventually filled in with sediment and is now a small animal farm. Residents of the area have indicated previously that they wanted the drainage issues in the area resolved, but that they were unwilling to give up any private property to easements for drainage improvements.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Elevation of existing structures
- Wet flood-proofing of existing structures
- Drainage improvements

Estate Barron Spots Area (including Strawberry Estate, Strawberry Hill, and Estate La Reine)

This large residential area, which is home to several hundred houses in each development, experiences significant storm water runoff flooding from multiple channels upstream, which are compressed into a single channel downstream, leading to sheet flow and fast moving water in the area. A single culvert exists downstream, which is obviously undersized. It must be noted that more permits are issued in this general area than anywhere else on the island, and that the primary foundation type in the area is slab on grade. Many structures in the area bear evidence of repeated flooding via visible high water marks.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Elevation of existing structures
- Wet flood-proofing of existing structures
- Drainage improvements

Mon Bijou Area

This residential area experiences significant flooding resulting from channelization of storm water runoff into the natural gut, which routinely results in flows that exceed the capacity of the natural gut. This has led to serious erosion of the gut, and resulted in severe foundation damage and drifting of structural elements of the residential structures that are in the area. Visible evidence exists of shifted or destabilized retaining walls and concrete driveways. As the erosion progresses, the damage to structures will likely continue. Approximately 8-10 homes are affected and most are believed to be uninsured.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Erosion control /Bank stabilization of the gut
- Drainage improvements

Lorraine Village Apartments Area

This residential housing complex consists of apartment homes of a split level design and some single family residences. Flood waters have entered several units throughout the complex. A drainage gut runs through the complex, crossing paved areas, and often overflows due to inadequate drainage and capacity. This overflowing has resulted in significant erosion of the area around the gut; one single family structure is in jeopardy of eventually falling into the gut due to foundation destabilization.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Wet flood-proofing of existing structures
- Erosion control /Bank stabilization of the gut
- Drainage improvements

William's Delight Area

This large residential area is home to more than 300 single family structures, and has experienced significant flooding for many years. The primary cause of flooding is undersized or inadequate drainage of storm water runoff in the area. A significant drainage project has been underway in the area for several years. The project seeks to install underground drainage piping to direct storm water runoff to the gut; the project has been partially completed. As a part of the project, the roadway surfaces were removed, leaving unpaved roads throughout the neighborhood. Funding is currently being sought to repave the roadways and to finish the drainage project.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Wet flood-proofing of existing structures
- Elevation of existing structures
- Drainage improvements

Frederiksted Area
This historical, mixed use district contains buildings and drainage dating to the 1700s. Most buildings are elevated, windows to modern base flood elevations, and have been so since their original construction. The existing storm water and surge drainage system (which is also original to the area) would be sufficient for the area if not for impervious surfaces and increased runoff from upstream. Improvements to drainage upstream would likely alleviate storm water runoff flooding in the area.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Drainage improvements (upstream)

Area-Specific Repetitive Loss Mitigation Strategies – St. John

Cruz Bay / Enighed Pond Area
This mixed use area is located in an area subject primarily to storm surge inundation, though some storm water runoff issues do exist. Repetitive flooding of a critical facility (electrical substation) has occurred, as well as repetitive flooding of roads and recreation areas.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Wet flood-proofing of existing structures
- Elevation of existing structures
- Drainage improvements

Coral Bay Area
This mixed use area is located in an area subject primarily to storm surge inundation, though some storm water runoff issues do exist. The area is prone to debris and washouts from flooding, and experiences significant runoff and erosion as a result of insufficient storm water management.

To mitigate this repetitive loss area, the following strategies (individually or in conjunction with one another) are recommended for consideration:

- Public education, outreach, and technical assistance to residents and builders, to develop and implement sound water management practices
- Acquisition and relocation/demolition of existing structures, and conversion of the property to open space
- Wet flood-proofing of existing structures
- Elevation of existing structures
- Drainage improvements

C.5 SUMMARY OF REPETITIVE LOSS PROPERTIES MITIGATION STRATEGY

Two primary sources of flooding exist in the US Virgin Islands – storm surge inundation and storm water runoff. As an island territory, storm surge inundation will continue to be a flooding source for the built environment on all three islands. Mitigation of storm surge inundation should be considered in terms of both individual structures and area drainage systems. Significant drainage improvements in the identified areas would have the potential to alleviate a significant portion of the existing storm water runoff and storm surge inundation flooding concerns. Any drainage improvements should take careful consideration of both the upstream and downstream effects, and should incorporate the natural drainage and floodplain patterns of the island wherever possible.