

# 1: Nepal, Main Supply Corridors

New Dehli - Birgunj Corridor  
Road Corridor: 987km, Estimated Travel Time: 4 days  
Rail Corridor: 918km

Kilometers  
0 100 200

China

# Logistics in Disasters

## Logistics Planning and Execution in a Disaster



Center for Excellence in Disaster Management & Humanitarian Assistance

Calcutta - Birgunj Corridor  
Road Corridor: 829km, Estimated Travel Time: 4 days  
Rail Corridor: 697km

Initial forecasted entry points

# Objectives

- o Intent of this brief is for participants to understand the role humanitarian logistics and the role the U.S. military plays in disaster response operations and the challenges, planning, and preparation involved.
- o Intent is to provide a better understanding of logistics in disasters, not to convey how logistic support shall be conducted during civilian-military engagements.
- o We will also discuss who the various players are when it comes to logistics during an HADR operations, both civilian and military and how they differ and organize themselves.

# Introduction

The military provides logistics because they bring UNIQUE military logistics capabilities. The speed of response can also be unique.

Disaster logistics bring about challenges, therefore it is important to note the capabilities of the affected state - not just in logistics, but in planning and preparation for a disaster- hugely impact logistics operations.<sup>1</sup>

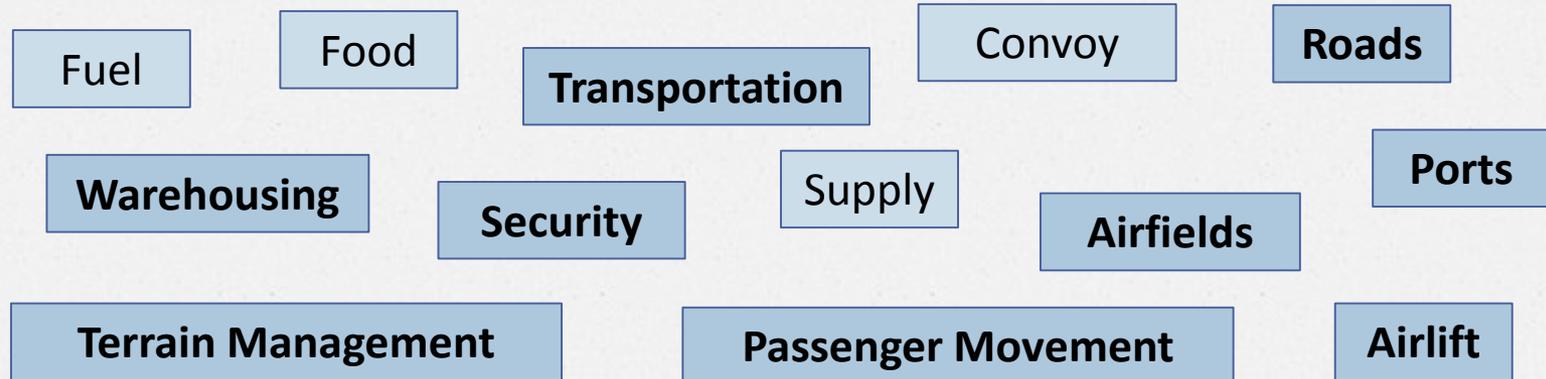
Logistics is a major task for all responders. Military forces (U.S. military for the purpose of this brief), is largely logistic support to the affected state and humanitarian community.<sup>2</sup>

1. "Humanitarian Logistics, Meeting the Challenge of Preparing for and Responding to Disasters," Martin Christopher and Peter Tatham

2. "Humanitarian Logistics, Meeting the Challenge of Preparing for and Responding to Disasters," Martin Christopher and Peter Tatham

# Logistics: A Key Capability

**“One of the starkest messages the tsunami provided was the fact that the effectiveness of humanitarian and response hinges on logistics efficiency.”<sup>3</sup>**



# Humanitarian Logistics versus Military Logistics

## **HUMANITARIAN LOGISTICS:**

*“The process of **planning, implementing** and **controlling** the efficient, cost-effective **flow and storage** of **goods and materials** as well as related **information**, from the **point of origin to the point of consumption** for the purpose of meeting the end **beneficiary’s requirements.**”<sup>4</sup>*

**Needs-Based: PULL Method**

## **MILITARY LOGISTICS:**

*“The discipline of **planning** and **carrying out** the **movement** and **maintenance** of **military forces.**”<sup>5</sup>*

**PUSH Method**

4. “Humanitarian Logistics, Meeting the Challenge of Preparing for and Responding to Disasters,” Martin Christopher and Peter Tatham

5. Air University. The Intellectual and Leadership Center of the Air Force. Gateway to Logistic. *Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms.* <http://www.au.af.mil/au/awc/awcgate/awc-logi.htm#definition>

# Humanitarian Challenges in Disaster Logistics

## **Needs Assessment:**

- Unpredictable demand
- Terms of timing
- Geographic location
- Type of commodity
- Quantity of commodity

## **Lack of emphasis on logistics planning:**

- Short lead time
- Suddenness of demand –large amounts
- Wide variety of products and services

## **Measuring of efficiency of logistical support:**

- High humanitarian stakes
- Timelines in the face of global media
- High anticipatory attention of the donors.
- Appropriateness of Donations

## **Shortage of professional logisticians:**

- Lack of initial resources in terms of:
  - Supplies
  - Human resource
  - Technology
- Capacity and funding
- Logistics is expensive

# Disaster Type

## *Man-Made*

## *Natural*

***Rapid  
Onset***

Terrorism  
Fires  
Explosions

Volcanic Eruptions  
Earthquakes  
Flash floods  
Landslides  
Typhoons/cyclones/  
Hurricane  
Floods

***Slow  
Onset***

Chemical Spill  
War/Conflict  
Social Unrest

Droughts  
Environmental Degradation  
Desertication

Details on each type event

# Floods

## Characteristics

In aggregate, more damaging than other natural disasters

**Number of people affected by major flood disasters worldwide from 1995 to 2015 – 2.3 billion<sup>6</sup>**

Floods attract little international attention

**Until the situation reaches a disaster threshold**

Difficult to discern between normal and disaster

**Floods that affect some Indo-Asia-Pacific countries annually**

The Asia Flood Network

**USAID/OFDA actively assists with early warning via satellite monitoring<sup>7</sup>**

**30-50% of USG responses in the Indo-Asia-Pacific<sup>8</sup>**

## Primary Needs

Water Rescue

Shelter

Search and Rescue (SAR)

Debris removal

Medical

Food

Water

Sanitation/Hygiene

Airlift support

## Considerations

Infrastructure Damage

Accessibility/Standing water

Displacement of persons

Communicable disease

Mass Casualties

6. Davies, R. 2016. UN-1995 to 2015, Flood Disaster Affected 2.3 Billion and Killed 157,000. Flood List. <http://floodlist.com/dealing-with-floods/flood-disaster-figures-1995-2015>

7. Center for Excellence in Disaster Management and Humanitarian Assistance. Foreign Humanitarian Assistance. USPACOM Senior Leader Seminar. February 2015

8. USAID. Humanitarian Assistance in Review. East Asia and the Pacific, Fiscal Year (FY) 2005-2014. <https://www.usaid.gov/sites/default/files/documents/1866/USAID-DCHA%20EAP%20Humanitarian%20Assistance%20in%20Review%20-%20FY%202005-2014.pdf>



# Earthquakes

## Characteristics

Sudden onset and lack of predictability  
**lead to high levels of casualties**

The timing and full impact of ground shaking is difficult to determine

Building collapse and liquefaction  
**are the leading causes of damages and injuries**

USG responds mostly to earthquakes with a magnitude of 6.0+<sup>9</sup>

Medical treatment, search and rescue  
**comprise the majority of USG support**<sup>10</sup>

## Primary Needs

Search and Rescue (SAR)  
Debris removal  
Trauma/Medical  
Safe open Spaces  
Shelter  
Food  
Water  
Airlift support

## Considerations

Infrastructure Damage  
Accessibility/debris  
Displacement of persons  
Mass Casualties

9. Center for Excellence in Disaster Management and Humanitarian Assistance. Foreign Humanitarian Assistance. USPACOM Senior Leader Seminar. February 2015

10. USAID. In the aftermath of January 2010 earthquake in Haiti, USAID has provided relief, recovery and long-term reconstruction assistance



# Volcanoes

## Characteristics

Clear warning signs before erupting  
**Casualties are low due to precautionary evacuations**

Large numbers of people are displaced  
**Danger zones are evacuated for long periods of time**

Huge areas affected for many years

USG response to volcanic eruptions is rare

USG support in the form of scientific expertise<sup>11</sup>

## Primary Needs

Search and Rescue (SAR)  
Debris removal  
Medical  
Safe open Spaces  
Shelter  
Airlift support

## Considerations

Infrastructure Damage  
Accessibility  
Displacement of persons  
Pulmonary Health concerns  
Ash/Smoke



# Tropical Systems

## Characteristics

Among the most devastating hazards on Earth  
**Size and intensity can cause many casualties across a large area**

Damage is complex and difficult to predict  
**Many factors are key -storm attributes and where it makes landfall<sup>12</sup>**

**70-80 percent of casualties caused by drowning<sup>13</sup>**

USG responds to all strength categories of storms  
**relatively weak tropical systems can have devastating impacts due to flooding**

Critical infrastructure likely to be non-operational  
In the impact area

Pre-and post-storm actions reduce vulnerability  
**USG can perform these actions without being on the ground<sup>14</sup>**

## Primary Needs

Search and Rescue (SAR)  
Debris removal  
Trauma  
Shelter  
Food  
Water  
Sanitation/Hygiene  
Airlift support

## Considerations

Infrastructure Damage  
Accessibility/debris  
Displacement of persons  
Standing water

12. Center for Excellence in Disaster Management and Humanitarian Assistance. Foreign Humanitarian Assistance. USPACOM Senior Leader Seminar. February 2015

13. PLOS. 2013. Current Disasters. The human impact of tropical cyclones: A historical review of event 1980-2009 and systematic literature review.

14. Center for Excellence in Disaster Management and Humanitarian Assistance. Foreign Humanitarian Assistance. USPACOM Senior Leader Seminar. February 2015



# Tsunamis

## Characteristics

Unpredictable nature affects tsunami preparedness

**Warnings issued minutes to hours before impact, resulting in variable estimates of casualties and damages<sup>15</sup>**

Low lying coastal areas are high risk

Particularly damaging to coastal infrastructure

USG responded to **7 tsunamis in past 10 years in the Indo-Asia-Pacific; 2 were catastrophic, 3 involved DoD support<sup>16</sup>**

## Primary Needs

Search and Rescue (SAR)

Debris removal

Trauma/Medical

Shelter

Food

Water

Sanitation/Hygiene

Airlift support

## Considerations

Infrastructure Damage

Accessibility/Debris

Displacement of persons

Standing water

Mass Casualties

15. Center for Excellence in Disaster Management and Humanitarian Assistance. Foreign Humanitarian Assistance. USPACOM Senior Leader Seminar. February 2015

16. Center for Excellence in Disaster Management and Humanitarian Assistance. Foreign Humanitarian Assistance. USPACOM Senior Leader Seminar. February 2015



# Drought

## Characteristics

### Slow onset

**Low levels of precipitation or prolonged drought conditions may lead to soil degradation and prolonged food shortages<sup>17</sup>**

**Particularly damaging to rural populations**

### Conflict

**May lead to disputes, social unrest and violence**

## Primary Needs

**Water**

**Food**

**Security**

**Shelter**

**Airlift support**

## Considerations

**Relocation of persons**

**Famine**



# Technological Disaster

## Characteristics

### Localized event

- Oil spills
- Radiation Leaks
- Explosions
- Fires
- Hazardous Materials

Emergency is typically confined to a specific location

Sudden Onset Emergency

May cause secondary and tertiary events: **Fires, Additional Explosions, Hazardous Material Release**

Response requires specialized personnel: **Trained in hazardous materials handling and removal**<sup>18</sup>

## Primary Needs

Specialized equipment

Medical

Shelter

Decon/Hazmat

Airlift support

## Considerations

Infrastructure Damage

Exposure

Accessibility

Displacement of persons



# Conflict

## Characteristics

### Localized event or Trans-National event

Conflict is typically confined to a geographic location

### Sudden Onset Emergency/ Progressive

May cause secondary and tertiary events: **Violence, Internationally Displaced Persons, Refugees, Armed conflict, civil unrest, explosions, fires, etc.**

Response requires specialized personnel: **Trained in armed conflict and humanitarian response**

Access to affected population may be limited or result in resistance

## Primary Needs

Water  
Food  
Security  
Shelter  
Medical  
Airlift support

## Considerations

Infrastructure Damage-Fires/explosions  
Famine  
Accessibility-Armed conflict  
Displacement of persons-IDPs  
Refugees



# Public Health Disaster

- o There is a correlation between the **type** of disaster and its **impact** on health;
  - o Population displacements and environmental changes may increase the risk of a spread in communicable diseases.
  - o In general, though, epidemics are *not caused* by natural disasters;
  - o Immediate and potential health hazards in the aftermath of a disaster tend to strike at different times
- o Ebola- Monrovia, Liberia
    - o U.S. military - medical logistics for the Ebola outbreak



Any disaster can “become” a Public Health disaster  
....now for Logistics Challenges

# Distance Matters

- o Inland Event
- o Nepal Earthquake, 2015

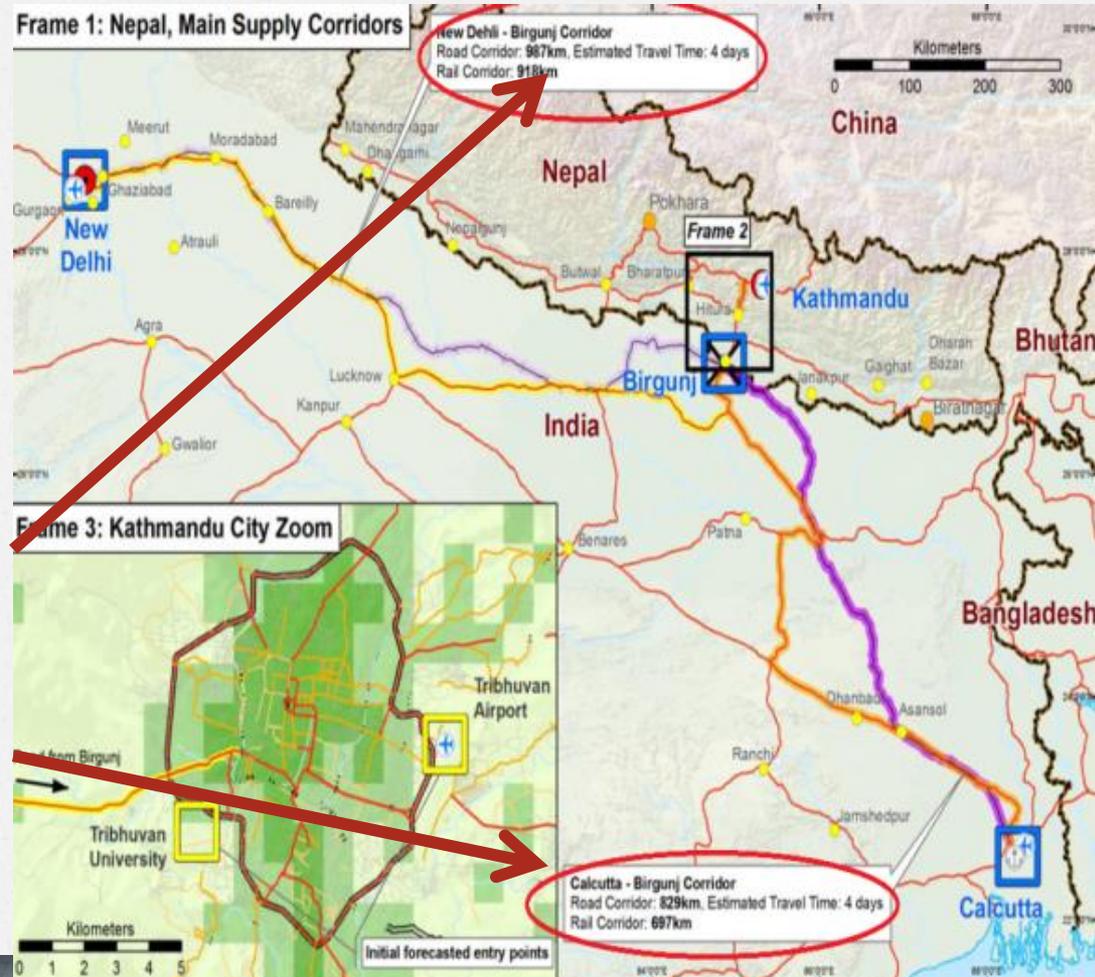


Photo credit: United States Department of Defense. 2015. By Jeffery D. Anderson. *Delivering Hope*. <https://www.defense.gov/Photos/Photo-Gallery/igphoto/2001519578/>

Photo credit: United Nations Development Programme. 2015. *Nepal Earthquake*. <https://www.flickr.com/photos/unitednationsdevelopmentprogramme/16679031624/in/photolist-rpSp1L>

Photo credit: The World Food Program. *WFP Logistics, We Deliver*. PowerPoint Presentation

# Distance Matters

- o Oceanic Event
- o Super Typhoon Haiyan
- o Access by sea and air
  - o Evacuation Routes
  - o Supply Routes

## Typhoon-affected population

### AFFECTED POPULATION

As percentage of total population in province

Less than 10	10-50	50-99	100%
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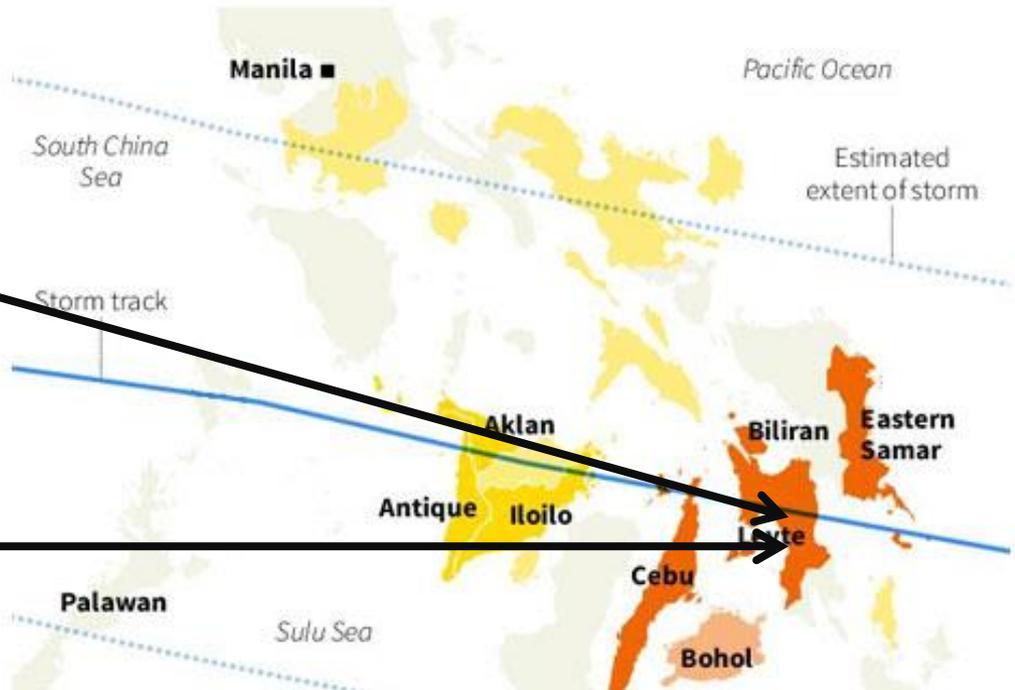


Photo Credit: DVIDSHUB. 2013. *MV-22 Ospreys Provide Airlift During Operation Damayan.* <https://www.flickr.com/photos/dvids/10927973935/in/photolist-hDEHVH>

Photo Credit: Indianexpress.com. *B\_Id\_438747.jpg.* Accessed on 18 Jan 2018 from [http://static.indianexpress.com/pic/uploadedImages/bigImages/B\\_Id\\_438747.jpg](http://static.indianexpress.com/pic/uploadedImages/bigImages/B_Id_438747.jpg)

Photo Credit: Official U.S. Navy Page. 2017. *A landing craft enters the well deck of the USS Kearsarge.* <https://www.flickr.com/photos/usnavy/36105209364/in/photolist-X1uCRJ>

# Scale Matters

## Considerations<sup>19</sup>

- Coordination
  - Intergradation of assets
- Damage to main supply hubs
  - Resources depleted
- Potential failure of local government



19. USAID. 2015. Nepal Earthquake - Fact Sheet #1 (FY16). <https://www.usaid.gov/nepal-earthquake/fy16/fs01>

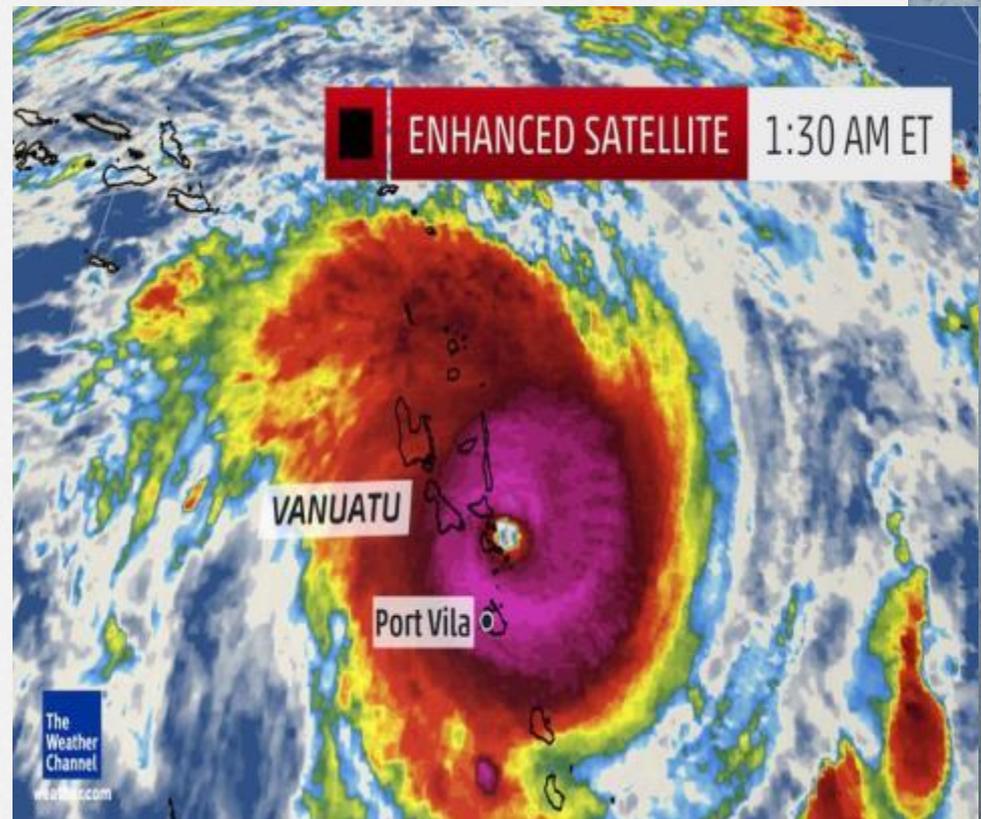
Photo credit: The Washington Post. 2015. Nepal's Earthquake: Mapping its ripple effect across Asia. <https://www.washingtonpost.com/graphics/world/nepal-earthquake/>

Photo credit: Koirala, J. 2015. Government Failure in Disaster Management: Evidence from Nepal's Earthquake 2015. <https://www.linkedin.com/pulse/government-failure-disaster-management-evidence-from-nepal-koirala>

# Scale Matters

## Small Island State

- o **Vanuatu – Pam**
- o Total Population: 270 Thousand (2015)
- o CAT 5 Cyclone
- o 167 thousand persons affected
  - o More than **50%** of total population affected
  - o Erromango Island- 90 % of shelters were destroyed
  - o Tanna Island- 50 % of shelters were destroyed<sub>20</sub>



# Logistics Planning & Execution

- Infrastructure, equipment, accessibility and transportation
- Essential to plan for the arrival, storage, and distribution of emergency supplies<sup>21</sup>
- Example: Nepal Earthquake-Preliminary Damage Assessment-Roadways

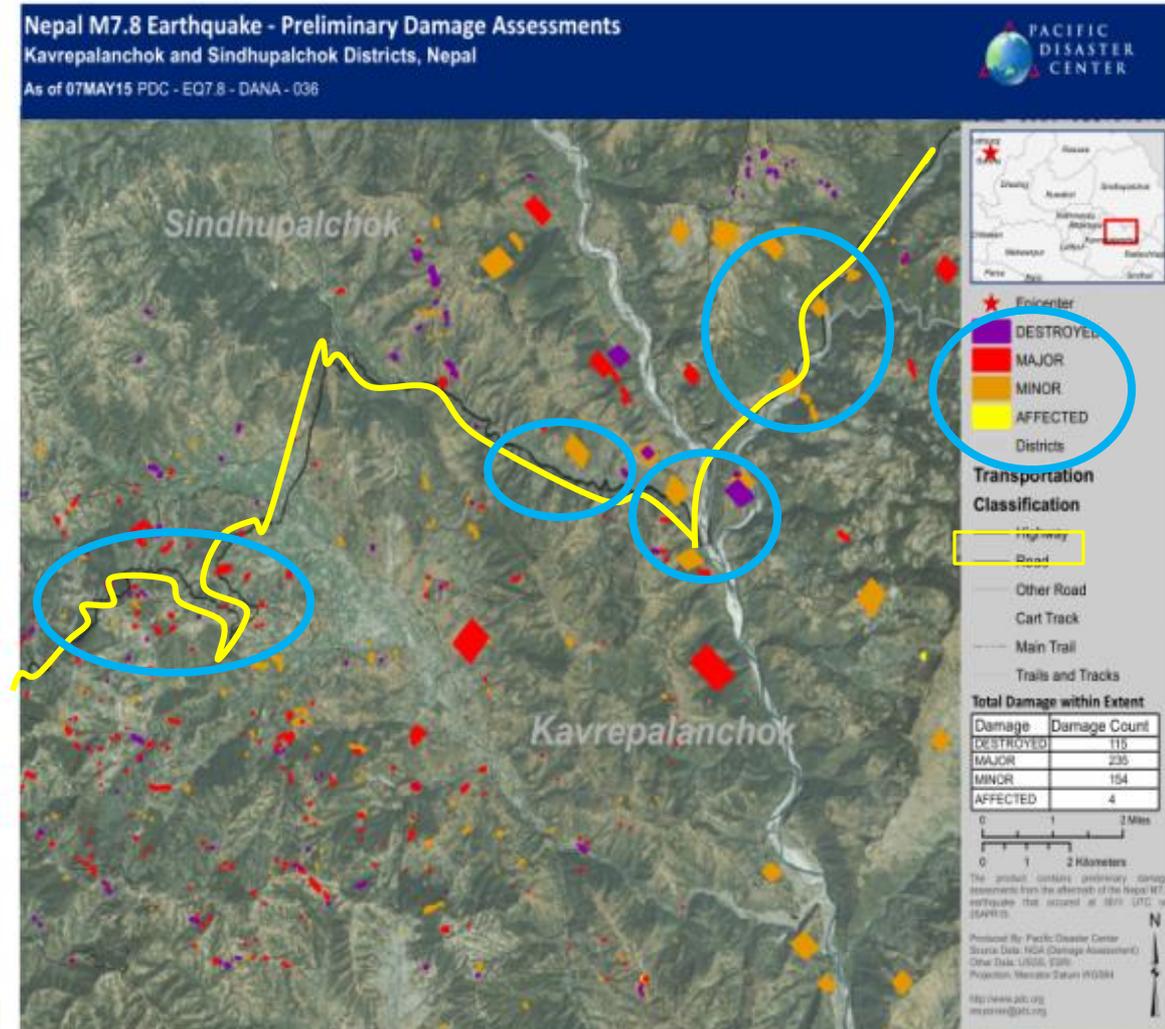


Photo Credit: Pacific Disaster Center, 2015.

<sup>21</sup> Reliefweb, 2015. Nepal M7.8 Earthquake -Preliminary Damage Assessment Kavrepalanchok and Sindhupalchok Districs, Nepal as of 07 May 2015. <https://reliefweb.int/map/nepal/nepal-m78-earthquake-preliminary-damage-assessments-kavrepalanchok-and-sindhupalchok-0>

# Roads and Bridges

- o Post disaster
  - o Roads and passages will be impassable
  - o Debris, landslides, standing water, etc.
- o Plan to incorporate alternative bypass routes to reach the affected areas
- o Populations
  - o Isolated and without adequate resources



# Seaports and Airfields

- o Passenger terminal at **Sendai Airport** post tsunami in Japan on March 11, 2011
  - o Inoperable
    - o Limited accessibility
    - o Damage to infrastructure
    - o Runway debris
  - o Secondary disasters
    - o Fires
    - o Explosions
    - o Flooding<sup>22</sup>



# Seaports and Airfields

- o Port-au-Prince, Haiti Port after 7.0-magnitude earthquake in 2010
- o Inoperable Port
  - o Not accessibility
  - o Damage to infrastructure
  - o Virtually all of the structures, not made out of concrete or steel were destroyed<sup>23</sup>



Next are logistics capabilities /enablers in HADR....

# Joint Task Force-Port Opening (JTF-PO)

## o JTF-PO Aerial Port of Debarcation (AOD)

o This capability is unique to the military and one of the most utilized in recent large scale disasters (Haiti and Nepal):

- o Has a 12-hour response time
- o Consists of elements from the following:
  - o Air Mobility CRG
  - o 55-person surface element (U.S. Army)

## o JTF-PO seaport of debarkation (SPOD)

- o 12-hour response time
- o Capabilities provided include:
  - o Joint-trained and lead element
  - o assess and open a distribution node and network
  - o Organic or contract transportation
  - o Joint assessment team conduct focused port and distribution assessments
  - o conduct movement-control operations and cargo-onward movements
  - o in-transit visibility- of forces and cargo at both port and debarkation and forward distribution node<sup>24</sup>

JTF-PO was used in Haiti response

# Joint Logistics Over-the-Shore (JLOTS)

## o JLOTS Capabilities

- o JLOTS provides a unique capability
  - o Offsets port denial
  - o Offsets port draft
  - o Offsets port congestion
- o Provide Intra-theater Lift
- o Augment an established port
- o Supplement a degraded port
- o Create a port

## o JLOTS Equipment

- o Floating causeway ferry discharge
- o RO/RO Discharge Facility
- o Elevated Causeway
- o Logistics Support Vessel<sub>25</sub>



# Warehousing and Supply Chain Management

- o **Local**
  - o Affect State assets
  - o Pre-determined or spontaneous if pre-planning is absent
- o **WFP- UNHDR**
  - o Pre-staged supplies in pre-determined locations
  - o Onsite temporary or permanent warehousing solution
  - o Often pre-planned
- o **Commercial**
  - o Donations/relief supplies-public locations
  - o Designed after or at time of event
- o **Non-Government Organizations (NGOs)**
  - o Each will have a staging/warehouse location
  - o Designated upon set-up in affect state

# UN WFP Logistics Cluster

## UN WFP Logistics Cluster is a Coordination mechanism hosted by WFP

- o Activated when there are response and coordination gaps in addressing humanitarian needs
- o Provides for strategic coordination, information management and the facilitation of common logistics services by road, air, and sea
- o Provides for the humanitarian community as a whole

## United Nations Humanitarian Response Depot (UNHRD)<sup>27</sup>

- A network of strategically located hubs for prepositioning relief items and humanitarian support equipment.
- Prepositioning helps to facilitate the PULL system vice defaulting to a push system which can clog up Main Supply Hubs



Photo credit: The World Food Programme. *WFP Logistics, We Deliver*. Brief.

# Prepositioning

## World Food Program- United Nations Humanitarian Response Depots (UNHRD):

- o Africa, United Arab Emirates, Malaysia, Spain, Panama, **Italy**

## USAID's warehouses of emergency relief items are strategically located in:

- o Italy, Malaysia, United Arab Emirates, **Florida, USA**

## ASEAN- AHA Center Warehouse:

- o Located in Subang, Malaysia with World Food Program Depot



ASEAN-AHA Center  
Warehouse,  
Malaysia



USAID Warehouse,  
Florida



WFP UNHRD, ITALY

# International Agreements

- o Acquisition and Cross-Service Agreements (ACSA)
- o Mutual Logistics Support Agreements in the Pacific (MLSA) for military cross-support<sup>28</sup>
  - o Relationships between nations can be formalized by treaty or other forms of arrangement
  - o Some are binding in international or national law and contain mandatory language whereas others rely on political and moral obligation
  - o It is important that the legal status of the arrangement is clearly understood by both parties

## Transition Key Points

- Consider transition planning **as soon as possible**
- Coordinate closely with the **Lead Federal Agency, USAID OFDA**
- **Based on strong assessments, understood needs, clear objectives**
- Tasks handed off deliberately to an adequate organization; Affected State, United Nations, NGO, civilian contract
- **Develop milestones with defined criteria for the transfer of tasks and conduct monitoring** to ensure sustainment of transitioned functions
- Some tasks are simply completed and do not require handoff
- Diminishing MITAMS from USAID OFDA
- **Transparent** in transition planning, ensure the Affected State and aid agencies understand the deliberate plan (time, capacity, funding, etc.)

Next are Transition Slides on the *DOD Response to Ebola in West Africa....*



# Transition

General Rodriguez told me when I was coming over here, “You are going to **bring speed, flexibility, and confidence**. That’s what you are going to bring to Liberia from the DOD perspective and the joint force. But what I want to **make sure you don’t do is put in a capacity or capability that can’t be sustained.**”

- Major General Gary Volesky, JFC-UA, Commanding General

- Mission exit was considered from the beginning
- USAID identified potential partners within the GOL or an NGO
- JFC-UA established specific handover criteria for the eventual reassignment of each specific task
- JFC-UA’s disciplined regard to sustainability prevented an unintentional expansion of tasks and responsibilities (mission creep)

**Transition of ETU Sustainment** UNCLASSIFIED

Operational Handover to Liberian Operator Control Field

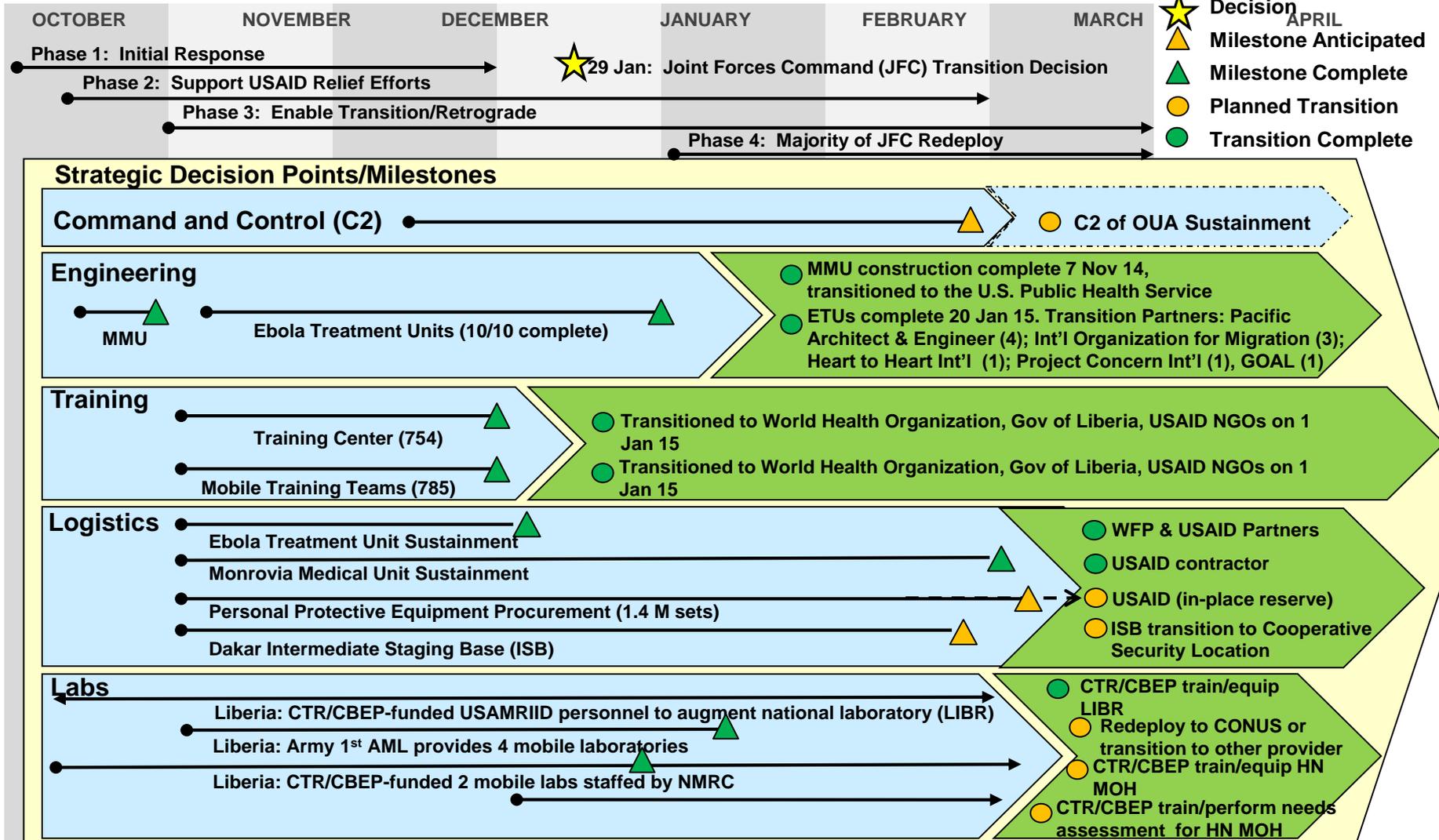
ETU	Site	Area	Area Size (km <sup>2</sup> )	Area Type	Supply to Site (T)	Transition Date
1	Bole	100	100	1	10 Dec 14	10 Dec 14
2	Bole	200	200	2	10 Dec 14	10 Dec 14
3	Yvesse	243	400	3	10 Dec 14	10 Dec 14
4	Yvesse	400	400	4	10 Dec 14	10 Dec 14
5	Yvesse	500	500	5	10 Dec 14	10 Dec 14
6	Yvesse	600	600	6	10 Dec 14	10 Dec 14
7	Yvesse	700	700	7	10 Dec 14	10 Dec 14
8	Yvesse	800	800	8	10 Dec 14	10 Dec 14
9	Yvesse	900	900	9	10 Dec 14	10 Dec 14
10	Yvesse	1000	1000	10	10 Dec 14	10 Dec 14

18 Air Assault!



# USAID/DoD/JFC Transition Plan

**DoD Mission:** Support the United States Agency of International Development (USAID) in Liberia to assist the U.S Government's Foreign Humanitarian Assistance / Disaster Relief (FHA/DR) efforts to contain the Ebola Virus Disease (EVD) IOT prevent EVD from spreading outside of the region, alleviate human suffering, and promote internal and regional stability. O/O transition the Joint Force Command (JFC) to designated entities.



# Summary

- o Logistics account for 80% of any HADR response
- o Different hazards have different requirements
- o Logistics challenges are compounded by infrastructure damage
- o NOT enough time is spent planning for disasters
- o NOT enough time is spent training for disasters



**Questions/Comments**