Empowering Digital Economy

ZTE Emergency Communication Solutions

ZTE

Natural Disaster Impact on Mobile Networks

Floods

Earthquakes

Mudslides

Forest Fire

Nature Disaster

Complex environment

Difficult to recovery

High risk

Hard/Dangerous to reach

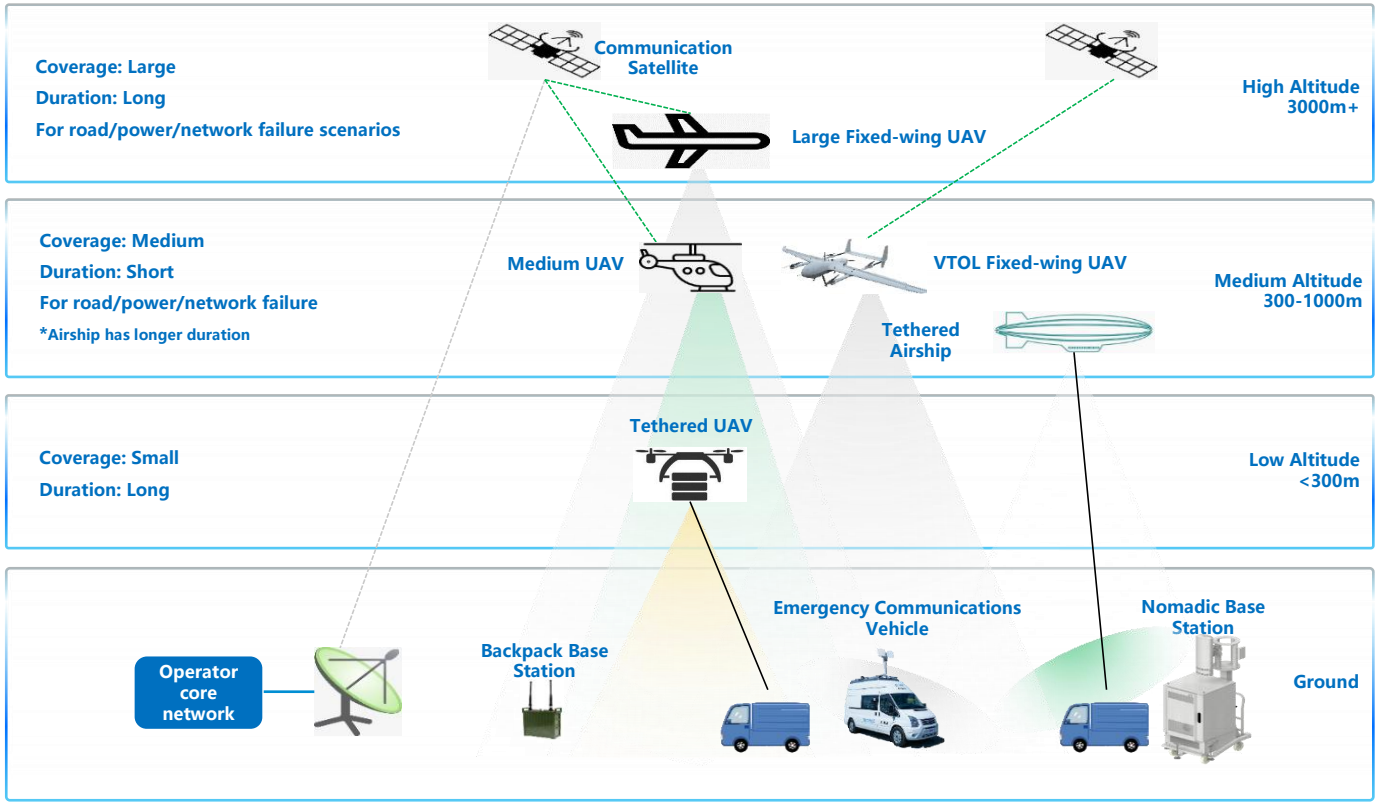
Power outage

Communication Interrupted

Integrated Space-Air-Ground Emergency Network

Solutions

- Satellite Emergency System
- Large Fixed-wing UAV Air-Space System
- UAV Aerial Base Station
- Tethered Airship System
- Tethered UAV Emergency System
- Emergency Vehicle
- Nomadic Base Station
- Backpack Base Station



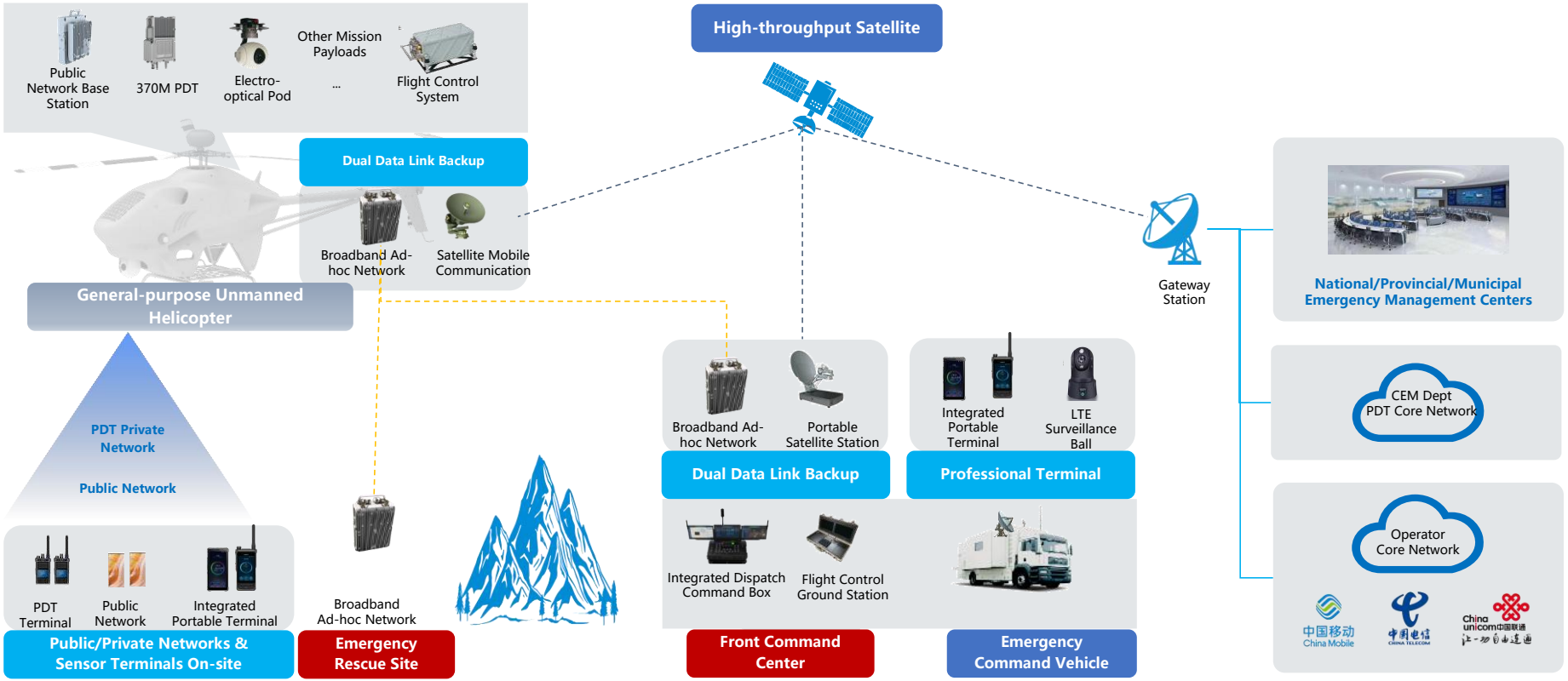
Emergency Solution Comparison

Item	Backpack Base Station	Nomadic Base Station	Tethered UAV	High-altitude Airship	Helicopter/VTOL Fixed-wing	Fixed-wing UAV
Type						
Application scenarios	Person accessible, vehicle inaccessible	Person/vehicle accessible			Road/power/network failure	
Operation Maintenance	Simple operation		Complex, requires specialists			
Backhaul Solution	Wired/Satellite backhaul				Satellite transmission	
Power supply	Grid/generator				UAV power	UAV power
Operating Time	Long duration		≤24h (actual mission ≤6h)	15-30 days	5-6 hours	12h
Cost	Low	Low	Medium	High	Relatively high	Very High
Coverage Distance	~1km	~0.5-1km	~2km	>10km (high-gain antenna)	~5-6km	~5-6km
Advantages	Portable, vehicle-inaccessible areas	Flexible transport, long operation	High flight altitude	High altitude, wide coverage, long duration	Suitable for road blocked /power outage/network failure	
Disadvantages	Coverage limited by antenna height	Coverage limited by mast height, requires vehicle access	Road access needed Airspace approval	Road access needed Airspace approval	Airspace approval limited Satellite backhaul bandwidth	Airspace approval limited Satellite backhaul bandwidth

UAV Emergency Communication Requirements

- **Base station:**
  lightweight, compatible with multiple drones.
- **Coverage:**
  wide coverage as possible
- **UAV:**
  medium or larger model UAV with enough space for equipment like following,
  private network equipment for rescue team
  triple-sensor pod for aerial imaging
  satellite communication device
  power supply for base station

ZTE UAV Emergency Communication Architecture



Large Type Unmanned Helicopter Base Station -Industry Leader

Unmanned helicopter base station

Unmanned helicopter:

- high payload, hover, power supply for base station
- omni antennas for ground coverage
- phased array satcom backhaul

Base station:

BBU/RRU，1-2 sets

Antenna:

Omni, 1.8GHz 8dBi gain

Drone type:

Unmanned helicopter, high payload, hover capable

Extensions:

PDT, Mesh Networking device

4G is suggested:

Satcom backhaul limitation

Cases:

Fully verification in several different disasters

Base station	BS8932 S1800	
Operation Index	Operating mode	LTE
	Operating frequency band	RX: 1710-1785MHz TX: 1805-1880MHz
	Bandwidth	75MHz
	RRC connections	≥1200
	Channels	2T4R
	Output power (W)	2*80W
Dimensions	Max weight (Kg)	20
	Equipment dimensions (mm H*W*D)	415mm x 296mm x 104mm(RRU) 275mm x 218mm x 55mm (BBU)
	Equipment size (L)	13
Power specs	Peak power consumption	60+510W
	Power supply	DC: -48V
Helicopter Model	**Specs**	
HY600	Maximum Takeoff Weight	700Kg
	Maximum/Cruiser Speed	170, 150Km/h
	Endurance	6 hours (with 200kg payload) 12 hours (with 100kg payload)
	Dimensions (m)	6.05m×1.72m×2.20m
	Static/Dynamic Ceiling	4500/6000m (takeoff weight 550kg)

Responsibility Matrix:

- ZTE:

  Provides unmanned helicopter, airborne base station, private network equipment, EO/IR pod, satcom terminal

- Operator:

  Ensures satcom-core network link operation

Medium Type Unmanned Base Station -Industry Leader

VTOL fixed-wing base station

VTOL fixed-wing:

- Lower payload, vertical takeoff/landing, power supply for base station/satcom.
- Integrated base station for ground coverage.
- Parabolic satcom backhaul.




Base station:

BS8932, outdoor waterproof, IP67, 4G only

Antenna:

Omni or directional

Drone type:

VTOL fixed-wing,

25kg payload required for base station + satcom

Specification item	Value range
Wireless air interface technology	4G LTE
Height × Width × Depth	395mm × 251mm × 142mm
Volume	14 L
Weight	12 kg
External antenna support	Yes
Operating frequency band	**RX: 889-915MHz; TX: 934-960MHz**
RRC connections	**≥1200 RRC connected users**
Number of channels	2T2R
Output power	2 × 10W
Average power consumption	150W
Peak power consumption	**190W**
Operating voltage	-48V DC
Optical interfaces × rate	2 × 10G/25Gbps
Installation method	Pole mount, wall mount

Responsibility Matrix:

- ZTE:

  Base station equipment

- Drone vendor:

  VTOL fixed-wing, power equipment, satcom, EO/IR pod, antennas, installation materials

- Operator:

  Ensures satcom-core network link operation

Unmanned Helicopter Base Station Test Results

Guangdong Yingde Test

China Telecom/Unicom: 1.8GHz

500m altitude, max DL >30Mbps

When the aircraft is about 5 km away from the terminal, the terminal loses connection. At the time of disconnection, the RSRP is around -110 dBm, the SINR is around 9 dB, and the downlink speed drops to approximately 4 Mbps.

*Air-ground interference reduced coverage distance

CEM Dept Muli Emergency Communication Rehearsal

Unmanned helicopter with public/private networks and EO/IR pod

WeChat video call under helicopter base station

Unmanned helicopter takeoff and coverage target

Unmanned helicopter UL/DL traffic test

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Thank You!

Digitizing Economy with 5G Industrial Innovations