TELUS Incident Management Ecosystem

We would like to begin by acknowledging that we are grateful to be here presenting on the traditional and unceded territories of the Musqueam, Squamish, and Tsleil-Waututh Nations. We acknowledge that TELUS' work spans many Indigenous Territories and Treaty areas.

Planning for Airplane Mode?

Share TELUS experiences and lessons learned from responding to recent local disasters

Help you understand threats, vulnerabilities and impacts your organization may be exposed to

Spotlight the incredible work TELUS teams do to support communities and customers during emergencies

What sets TELUS apart?

1. Our top priorities are customer service reliability and community support

2. We prioritize and invest in multiple layers of redundancy because we believe that our customers will stay with us long-term if they have a reliable service they can count on

   ○ TELUS has multiple "backbones" so that if one fails, the network remains operable
   ○ We have 11 "cores" or "network brains" located across the country to ensure redundancy
   ○ We invest in widespread fibre deployment because it is more resilient

3. We are more than a telecom provider – we are a connector of communities – and we use our asset base including Health and Agriculture businesses, along with our Community Outreach teams to provide funds, services, resources, and volunteers on the ground

4. Our emergency response teams are internationally recognized and awarded for our ability to mobilize during emergency events
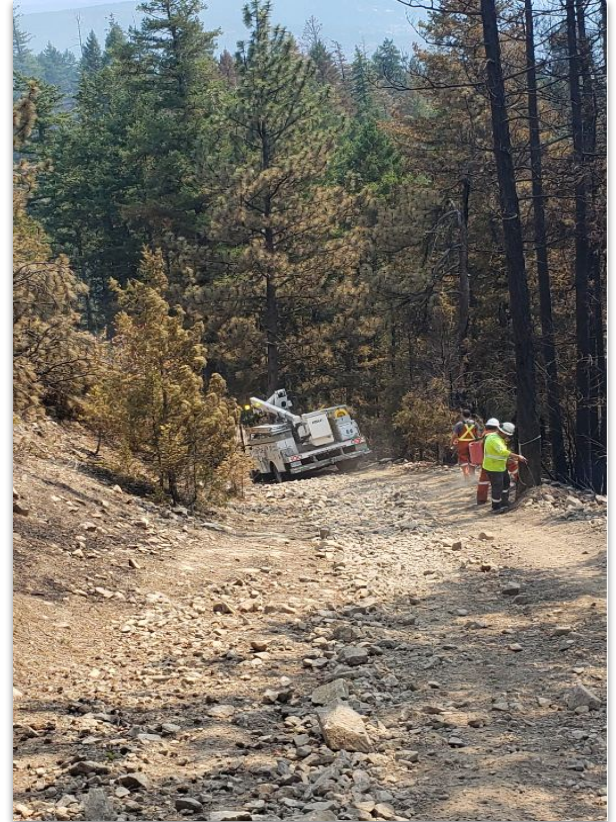
Causes of telecom disruption

Damage & destruction of network components

Damage & destruction of network components
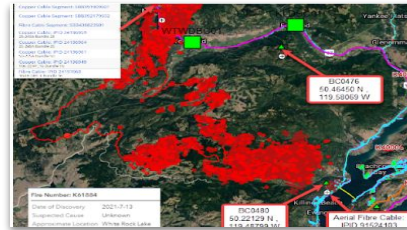
Natural hazard incidents

A natural event such as an earthquake, flood, wildfire or major weather event that results in a threat or direct impact to TELUS services, facilities, customers or communities.

Fort McMurray Fire 2016	B.C. Wildfire Season 2021	B.C. Atmospheric River November 2021	B.C. Winter Storms 2022
1 wireless cell site destroyed 3 of 32 DSLAMs were burnt 4,300 metres of copper cable replaced 2,100 metres of fibre cable replaced 17 pedestals replaced	1,600 metres of copper 40-50 joint use poles (Monte Lake) 3 km joint use poles, several fibre cables and GPON units (White Rock Lake) 5,000 metres transport fibre (Nimpo Lake) 8.4 km of fibre (Lytton)	Major impacts were noted in Abbotsford, Chilliwack, Merritt and Spences Bridge due to high water levels, BC Hydro outages and infrastructure loss	Winter storms with significant snow resulted in large scale power outages. As a result, TELUS facilities were kept online with backup power.

Community isolations

A community isolation exists when a First Nation, City or Regional or Municipal District is without wireline and wireless service, resulting in the inability to communicate.

Gold Bridge, BC	Gold River, BC	Foremost, AB	Terrace, BC	Gift Lake, AB	Jordan River, BC
"Commercial power failure at Mission Mountain Radio. Technicians unable to get to site to install a new generator due to weather".	*"Microwave Packet Radio card incident. Card failure resulted in the wireless sites going out of service".*	*"Third party directional drilling. Two wireless sites in the region were knocked out of service resulting in the isolation of a large geographic area".*	*"A beaver has caused a tree to fall on the hydro line which then caught fire, burning the TELUS fibre".*	*"Third party culvert drilling. Three hours were used in dispatching and locating the incident and repairs could not commence until morning due to safety concerns".*	*"Aerial copper vandalism isolated customers. Repeat incident impacting same customers the next week also due to cable theft".*
Weather & power failure	Hardware failure	3rd party damage	Wildlife (Beavers)	3rd party damage	Vandalism

Disruption to shared dependencies

Power & Utilities	People	Partnerships
Power is the core requirement for all network elements. Access to water supply and gas is required at some sites for cooling and site maintenance.	Our Team Members and supporting vendors are key to conducting damage assessments, triage, repair and restoration at all levels	We mutually depend on our peers and partners during emergencies to ensure rapid restoration and positive customer and community outcomes
Stakeholders ● Other CI providers ● Fuel suppliers	**Stakeholders** ● TELUS TMs, Vendors & Contractors ● Gov, EMOs, First Responders	**Stakeholders** ● Federal to Municipal EMOs & ISED ● Partner Telcos and CI providers
TELUS mitigation strategies: ● Fibre based network ● Overlap in coverage & leveraging 5G ● Fixed backup generators ● Batteries and UPS ● Fleet of pre-staged mobile generators	**TELUS mitigation strategies:** ● TMs at high readiness ● Pre-staged equipment and inventory ● Diverse communication channels	**TELUS mitigation strategies:** ● Leadership and regular engagement with EM community at all levels ● Participation in EOC activations and exercises ● Culture; positive human outcomes
Partner Ask: Support with prioritization of fuel provision and utilities restoral	**Partner Ask:** Freedom of movement and safe access to our facilities	**Partner Ask:** Continued inclusion and engagement before, during and after emergencies

Emergency Response

TELUS incident management lifecycle

Our first priority is to restore critical services as quickly as possible, while ensuring the safety of our teams

Before an incident

- 24/7 active threat monitoring

When a threat is identified

- Engage with EMOs, government, and critical infrastructure partners
- Engineers/technicians placed on standby
- Recovery supports dispatched

During an incident

- Activate incident management teams – dispatch techs & equipment
- Full alignment with EMOs, EOCs, and critical infrastructure partners
- Initiate public and government communications protocols

- Collaborate with and support agencies on the ground (i.e. Red Cross)
- Launch humanitarian support
- Provide impacted customers with compensation credits and/or free services

After an incident

- Build back better to further fortify network resiliency
- Support community re-entry & recovery
- Conduct post-incident reviews and improve for next time

Emergency response priorities and timeline

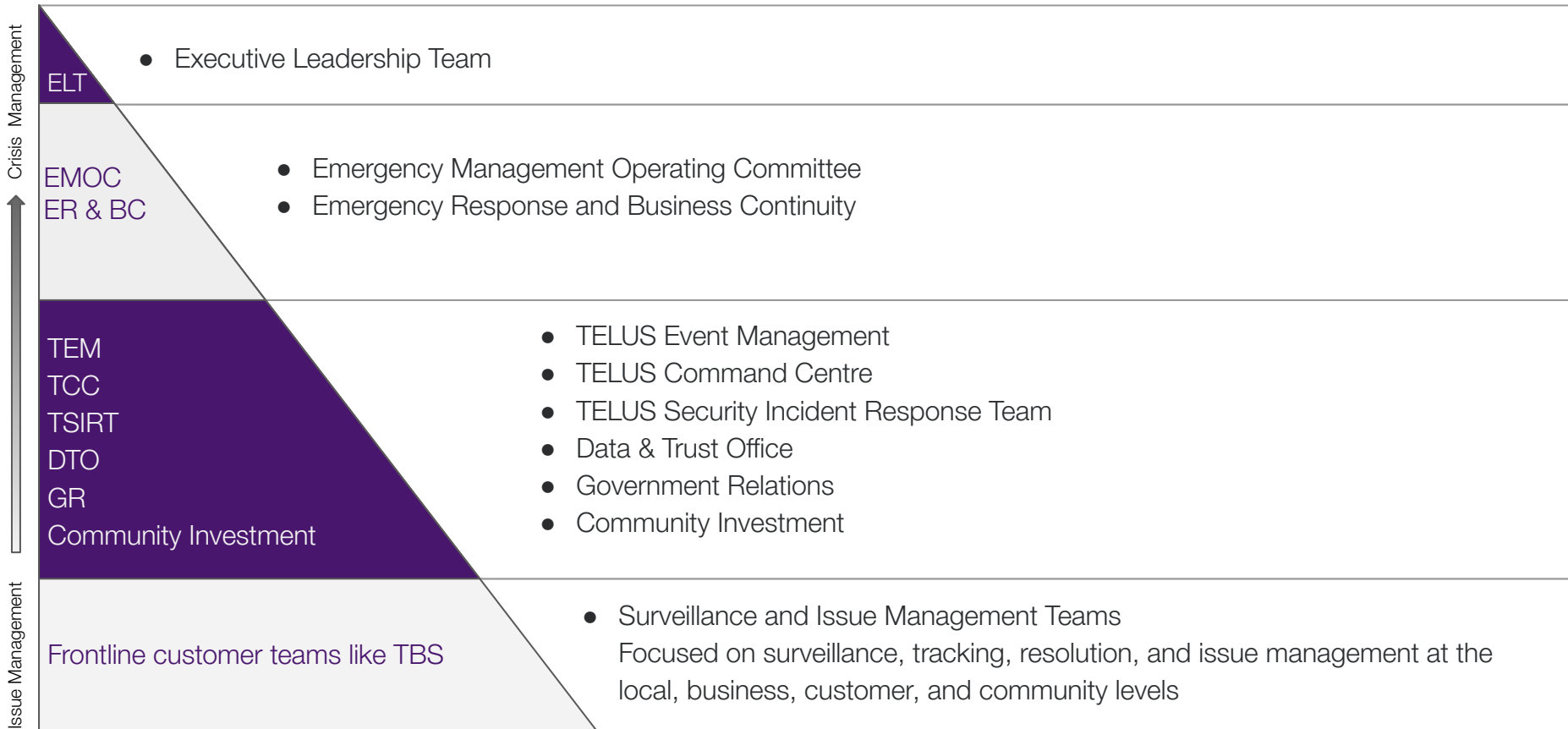| Incident Occurs	**Emergency response**	**Incident stabilization**	**Community recovery**	**Build back better**
	0 - 24 hours	1 - 5 days	1 - 12 weeks	3 - 12 months

Response priorities & use cases

First responder communications	**Response coordination**	**Enabling community recovery**	**Inspiring growth**
First responder bases	Responder EOCs	NGOs	Enabling positive human outcomes
Frontline ICPs	First Nations EOCs	Construction workers	Economic growth
Connecting isolated communities	Government EOCs	Recovery partners	Retiring copper and legacy infrastructure
First Nations EOCs	CI Partner EOCs	Health partners	
Municipal EOCs	**Supporting residents**	Community supports	
	Evacuation Centres	Returning residents	
	Evacuee Camps		

Flexible deployment model

Deployment stands down upon network and community recovery or continues through each stage based on unique needs of incident

TELUS incident management ecosystem

TELUS

Crisis Management

ELT
- Executive Leadership Team

EMOC
ER & BC
- Emergency Management Operating Committee
- Emergency Response and Business Continuity

TEM
TCC
TSIRT
DTO
GR
Community Investment
- TELUS Event Management
- TELUS Command Centre
- TELUS Security Incident Response Team
- Data & Trust Office
- Government Relations
- Community Investment

Issue Management

Frontline customer teams like TBS
- Surveillance and Issue Management Teams
  Focused on surveillance, tracking, resolution, and issue management at the local, business, customer, and community levels
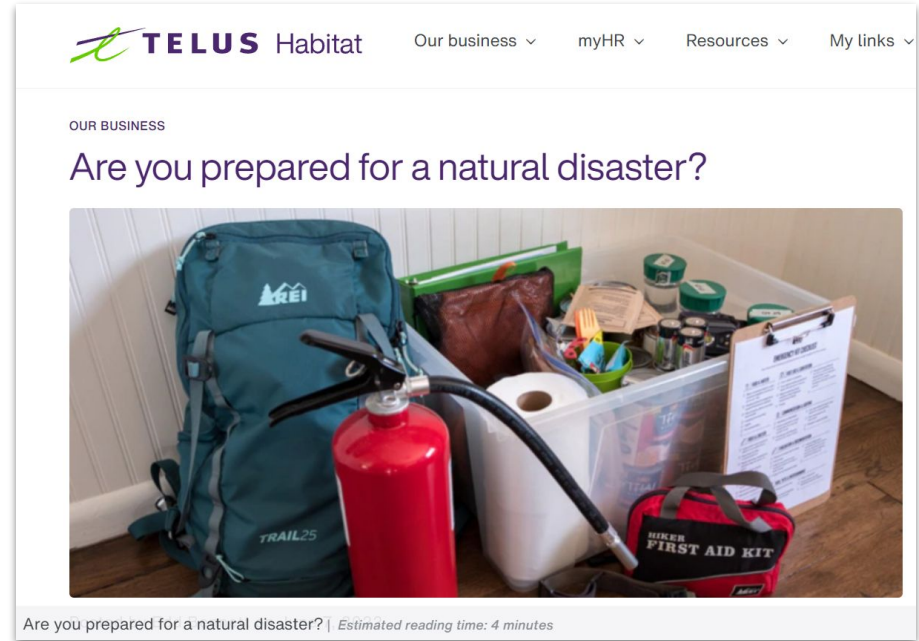
Managing risk

Prepare our people

Proactively address climatic threats that could impact TELUS operations or communities.

What we do

- Conduct seasonal preparedness workshops
- Deliver personal emergency preparedness workshops
- Consult on climate change adaptation initiatives
- Produce weekly severe weather outlooks
- Provide timely situational awareness for emerging severe weather threats
- Publish internal stories for business continuity week, emergency preparedness week, and EMOC activations

TELUS Habitat — Our business · myHR · Resources · My links

OUR BUSINESS

Are you prepared for a natural disaster?

Are you prepared for a natural disaster? | *Estimated reading time: 4 minutes*

Prepare our facilities

Identify, assess, protect and prioritize facilities, resources, or services essential to TELUS and its critical infrastructure

The Vital Points program is utilized by various business units for resilience activities such as prioritization of site testing, proactive maintenance, site hardening, fuel prioritization, fire-smarting, deployment and pre-staging of defensive measures (generators, batteries, tiger dams, spare fuel)

What we do

- Conduct failover tests
- Proactive maintenance
- Pre-staged inventory and assets
- Vegetation management
- Year-round hazard planning

Coordinate with partners

Promote and ensure the sharing of best practices in Resilience Planning, Business Continuity Management and Emergency Management with various government and regulatory agencies and functions

Stakeholders

Federal, provincial, territorial, and municipal emergency management organizations (EMOs)

ISED – Regional Emergency Telecoms Officers

First Response Agencies – BCWS, Fire, Police

Critical Infrastructure partners

Business Continuity Institute

Disaster Recovery Institute

What we do

- Participate and consult in emergency response exercises and programs
- Liaise with EMOs, partner telcos and other Critical Infrastructure providers
- Share and apply lessons learned from industry partners
- Manage the TELUS EOC brochure

EMOC – Leadership

2023	• Ontario / Quebec Ice Storm

2022	• Hurricane Fiona • Ukraine Crisis • COVID-19 global pandemic

2021	• BC vaccination contact centre • BC wildfires • BC atmospheric river related floods • COVID-19 global pandemic

2020	• COVID-19 global pandemic • Fort McMurray / Fort Vermillion ice jam floods

2019	• Ontario / Quebec floods • Northern Alberta wildfires • Hurricane Dorian • Manitoba snowstorm

2017	• Ontario / Quebec floods • BC wildfires

2016	• Fort McMurray wildfires

Ralph Goodale @RalphGoodale · 6m

Thnx to @telus for waiving charges for #FortMac evacuees + thnx to @telus workers for keeping telecoms up+running in N.AB #AlbertaStrong

Supporting communities

![TELUS logo]

Once EMOC is activated, the Corporate Citizenship team provides leadership and guidance on community support

- Identify opportunities to leverage our community relationships and successfully support charitable relief organizations on the ground

- Direct financial support through our established corporate programs showcasing our culture of giving and social purpose in action

TFFF & 13 Canadian Community Boards

Activate Text to Donate campaign and TELUS Match

All of TELUS approach Health, Lifeworks & Agriculture
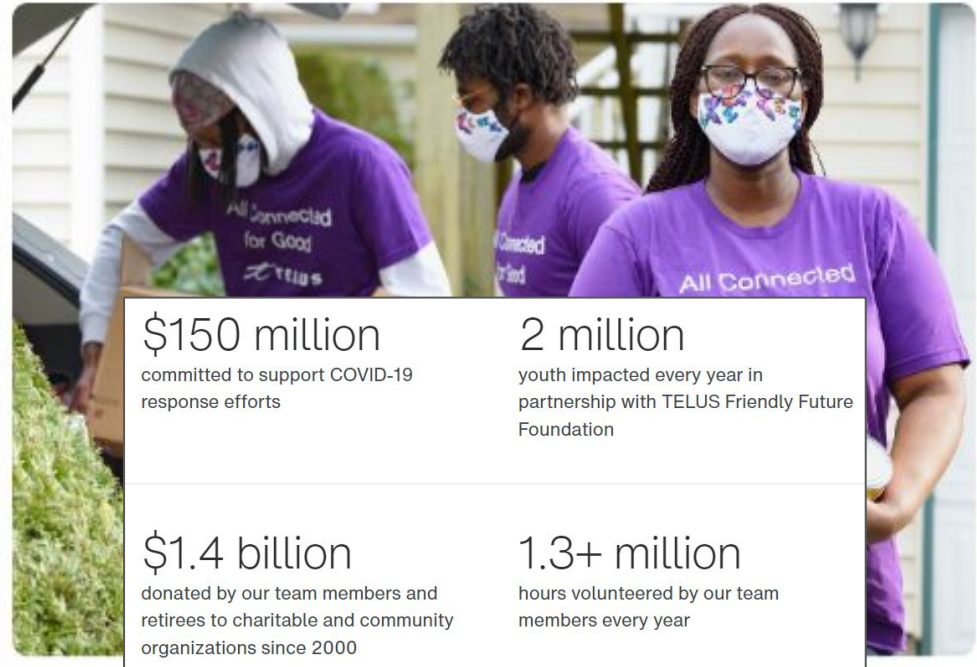
Engage our team in a relevant and impactful way

Amplify 'For Good' Programs supporting seniors, at-risk youth and homeless

Customer & community support

We give where we live, and are committed to supporting people and communities in need. We provide aid, resources and volunteers to assist during emergencies.

What we do

- Through TELUS Friendly Future Foundation, we work with local communities and charities to provide logistical support, aid and donations where needed
- Supply temporary wireless booster solutions where additional coverage is needed
- Deploy Wifi public hotspots to evacuation centres and resiliency centres
- Offer emergency cell phones and satellite phones to EOCs and ESS locations
- Establish crisis support helplines for impacted areas
- Waive overage fees and billing suppression
- Offer impacted customers replacements for lost or damaged phones

$150 million
committed to support COVID-19 response efforts

2 million
youth impacted every year in partnership with TELUS Friendly Future Foundation

$1.4 billion
donated by our team members and retirees to charitable and community organizations since 2000

1.3+ million
hours volunteered by our team members every year

Deploy emergency wireless solutions

COW (Cell on Wheels)

- Intended for connectivity where it has been lost, or where saturated
- Solution to provide longer term coverage
- Not intended to deploy coverage where it didn't previously exist
- Coordinated via TELUS EMOC
- Requires connection to transport solution (fibre backhaul to TELUS Network)
- Needs road accessibility
- Generator, shore power, fuel source

CALF

- Low bandwidth solution that can provide basic voice and data (500-1000m radius)
- Satellite backhaul to network
- Quick, easy deployment (used in Lytton prior to COW being deployed)
- Coordinated via TELUS EMOC
- Has satellite backhaul & requires open south facing view
- Needs road accessibility
- Generator, shore or solar powered

Heli-Peli PICO

- Small cellular base station designed to cover a small area (50m radius)
- Deployment to remote locations where cellular coverage does not exist
- Coordinated via TELUS EMOC
- Highly portable – can be flown in (helicopter)
- Has satellite backhaul & requires open south facing view
- Generator, shore power, fuel source

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