



**FRONTIER**  
*How You Measure Matters*  
**PRECISION+**



**SURVEY**

 **Trimble**  
Authorized Distribution Partner

 **SPECTRA**  
GEOSPATIAL  
AUTHORIZED DISTRIBUTION PARTNER

 **ENTERPRISE**

PRODUCTS | TRAINING | REPAIR | RENTALS

**WWW.FRONTIERPRECISION.COM**

— AN EMPLOYEE-OWNED COMPANY —

# Phaseout of 3G Cellular Networks and its Effect on Real-Time GNSS Networks



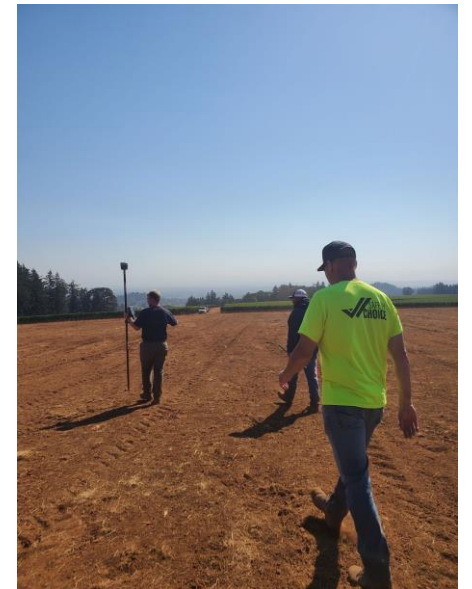
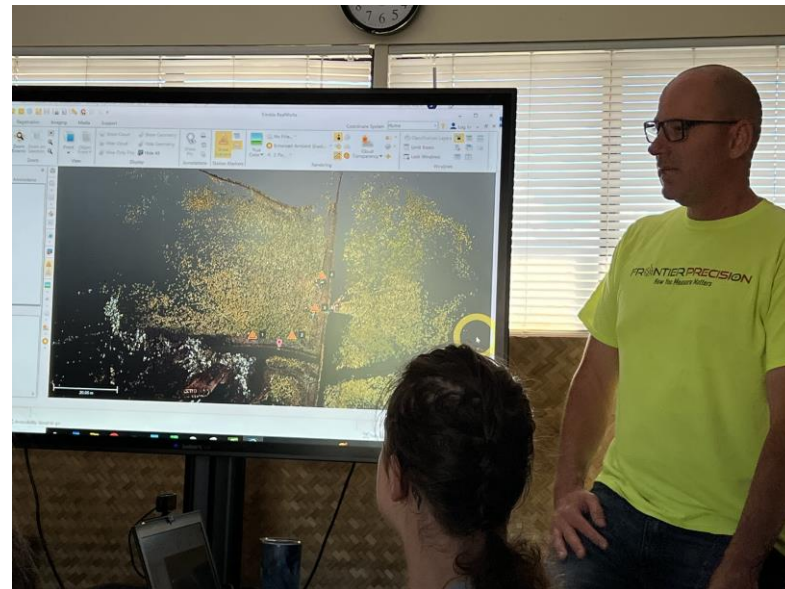
## Biography

BS (Geography) from Oregon State University

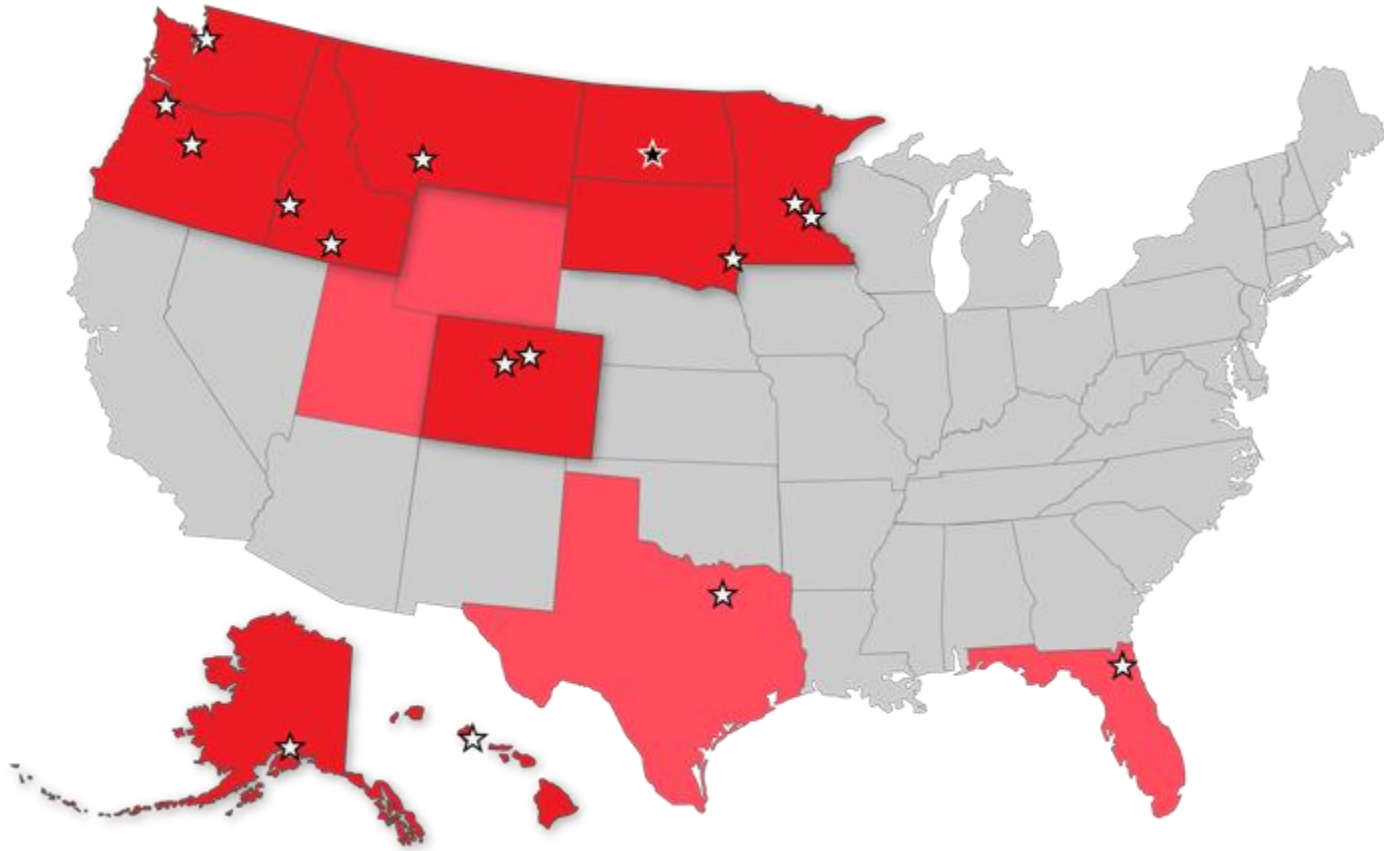
19-Years with Frontier Precision/GeoLine

Technical Support & Training

Survey, Scanning & Mobile LiDAR



WHEREVER YOU ARE, **WE ARE.**



From our original office in Bismarck, North Dakota, we've grown our footprint thousands of miles in every direction. Today, you'll find us in South Dakota, Minnesota, Colorado, Alaska, Montana, Idaho, Hawaii, Oregon, and Washington. Additionally, Frontier provides service in the states of Wyoming, Utah, Florida, and Texas.

We pride ourselves on offering exemplary customer service; and our industry professionals are here to help you find a solution to fit your needs.

## Overview

Requirements for Real-Time GNSS Survey

Evolution of Mobile Broadband Technology

Phase Out Plan of 3G Cellular Networks (FCC Statement)

3G & 4G Compatible Devices (Survey)

“What If” Discussion

Questions

# Requirements for Real-Time GNSS Survey

GNSS Receiver (NTRIP capable)

## Networked Transport of RTCM via Internet Protocol

---

From Wikipedia, the free encyclopedia

The **Networked Transport of RTCM via Internet Protocol** (**NTRIP**) is a [protocol](#) for streaming [differential GPS](#) (DGPS) corrections over the [Internet](#) for [real-time kinematic positioning](#). NTRIP is a generic, stateless protocol based on the [Hypertext Transfer Protocol](#) HTTP/1.1 and is enhanced for [GNSS](#) data streams.<sup>[1]</sup>

The specification is standardized by the [Radio Technical Commission for Maritime Services](#) (RTCM).<sup>[2]</sup> NTRIP was developed by the [German Federal Agency for Cartography and Geodesy](#) (BKG)<sup>[3]</sup> and the [Dortmund University Department of Computer Science](#).<sup>[4]</sup> Ntrip was released in September 2004.<sup>[5]</sup> The 2011 version of the protocol is version 2.0.<sup>[6]</sup>

NTRIP used to be<sup>[7]</sup> an [open standard](#) protocol but it is not available freely (as of 2020). There is an [open source](#) implementation available from [software.rtcn-ntrip.org](#) from where the protocol can be reverse-engineered.

Controller running NTRIP-RTK compatible software

Internet Access at RNSS Receiver

## Evolution of Mobile Broadband Technology

Technology	1G	2G	3G	4G	5G
Year	1979	1991	2001	2009	2019
Use Cases	Analog System, Dropped Calls, Giant Cell Phones	Texting (SMS), MMS, Conference Calls, Long Distance Call Tracking	Cheap data transmission, GPS, Web Browsing, SD Video Streaming	HD Video Streaming, Wearable Devices, High Speed Applications	Internet of Things, Cloud Storage, Remote Surgical Robots
Frequency	30 KHz	1.8 GHz	1.6-2 GHz	2-8 GHz	3-30 GHz
Bandwidth	2 kbps	364 kbps	3 Mbps	100 Mbps	10 Gbps
Avg Speeds	2 kbps	40 kbps	300 kbps	25 Mbps	150 Mbps
Range	N/A	50 mi	35 miles	10 miles	1,000 ft

# Phase Out Plan of 3G Cellular Networks (FCC)

## What is happening?

Mobile carriers are shutting down their 3G networks, which rely on older technology, to make room for more advanced network services, including 5G. As a result, many older cell phones will be unable to make or receive calls and texts, including calls to 911, or use data services. This will affect 3G mobile phones and certain older 4G mobile phones that do not support Voice over LTE (VoLTE or HD Voice).

Learn more about other connected devices, such as medical devices and home security systems that may be impacted below.

## When is it happening?

Some mobile providers have already completed the shutdown of their 3G networks, while others are scheduled to occur later in 2022. Plans and timing to phase out 3G services will vary by company and may change. Consult your mobile provider's website for the most up-to-date information.

- [AT&T](#) announced that it phased out its 3G network beginning in February 2022.
- [Verizon](#) announced that it will finish shutting down its 3G network by December 31, 2022.
- [T-Mobile](#) announced that it finished shutting down Sprint's 3G CDMA network as of March 31, 2022 and Sprint's 4G LTE network as of June 30, 2022. It also announced it shut down T-Mobile's 3G UMTS network as of July 1, 2022, but has not yet announced a shutdown date for its 2G network.

If your mobile carrier is not listed here, you may still be affected. Many carriers, such as Cricket, Boost, Straight Talk, and several Lifeline mobile service providers, utilize AT&T's, Verizon's, and T-Mobile's networks. In addition, international visitors to the United States with 3G phones will be affected and are urged to plan accordingly.

*Note: These are dates for completing the shutdowns. Carriers may begin retiring parts of their networks sooner.*



## 3G & 4G Compatible Devices (Survey)

Format	Device	OS	4G Compatible (Internal)	AT&T 4G Compatible (Internal)	Verizon 4G Compatible (Internal)
Controller	TSC3	Windows Mobile	NO	NO	NO
Controller	TSC5	Android	YES	YES	YES
Controller	TSC7	Windows 10	YES	YES	YES
Tablet	T10x	Windows 10	YES	YES	NO
Tablet	T100	Windows 10	YES	YES	YES
Tablet	T7	Windows 10	YES	YES	YES
Handheld	TDC600	Android	YES	YES	NO

AT&T      GPRS Technology  
 Verizon    CDMA Technology

# Verizon Website

<https://opendevelopment.verizonwireless.com/device-showcase>

## Certified devices (6)

NEW Certified in the last 30 days



### Trimble Mobile Computing Solutions TSC5

The Ranger S/TSC5 is a rugged handheld computer with a 5" sunlight...

Device Type  
Tablet

Network Technology  
LTE Only

LTE Category Support  
Cat 12

Compare

[Learn more >](#)



### Trimble Mobile Computing Solutions T100

A rugged, high-performance tablet that performs and executes both...

Device Type  
Tablet

Network Technology  
LTE with GSM/UMTS

LTE Category Support  
Cat 12

Compare

[Learn more >](#)



### Trimble Mobile Computing Solutions Nomad 5

The Nomad 5 is a rugged handheld computer containing a Qualcomm p...

Device Type  
Rugged Handheld / Smartphone

Network Technology  
LTE with GSM/UMTS

LTE Category Support  
Cat 6

Compare

[Learn more >](#)



### Trimble Mobile Computing Solutions Yuma 7

The Yuma 7 is a rugged handheld computer containing an Intel proc...

Device Type  
Tablet

Network Technology  
LTE with GSM/UMTS

LTE Category Support  
Cat 6

Compare

[Learn more >](#)



### Trimble Mobile Computing Solutions TSC 7

The Ranger/TSC 7 is a rugged handheld computer containing an Inte...

Device Type  
Rugged Handheld / Smartphone

Network Technology



### Trimble Mobile Resource Management SNM941

Communication box in support of Trimble GNSS, for construction ve...

Device Type  
Vehicle Monitoring

Network Technology

## “What If” Discussion

I own a TSC3 and want to use it for ORGN today?

I own TDC600 and want to use Verizon with ORGN?

I own an old MiFi hotspot and want to figure out if it will work for ORGN?

I don't really know much about what I have specifically, but want to get going on ORGN?

# CERTIFIED SERVICE CENTERS & REGIONAL OFFICES



 Frontier Precision  Certified Service Center  BuildingPoint America West



**BISMARCK, ND | HEADQUARTERS | 800.359.3703**

*Servicing North & South Dakota*



**ANCHORAGE, AK**

844.868.1500



**BEND, OR**

541.797.0052



**BOISE, ID**

800.523.6408



**BOZEMAN, MT**

855.208.8005



**DENVER, CO**

800.652.1522

*Servicing Colorado & Wyoming*



**GOLDEN, CO**

720.826.4410



**HONOLULU, HI**

808.465.3900



**JEROME, ID**

208.324.8006



**MINNEAPOLIS, MN**

877.698.3077



**PORTLAND, OR**

800.523.6408



**SEATTLE, WA**

800.523.6408



**SIoux FALLS, SD**

605.221.4400



**WAITE PARK, MN**

800.944.8557



**REMOTE/SATELLITE OFFICES**

LIBERTY, UT | FORT WORTH, TX | JACKSONVILLE, FL