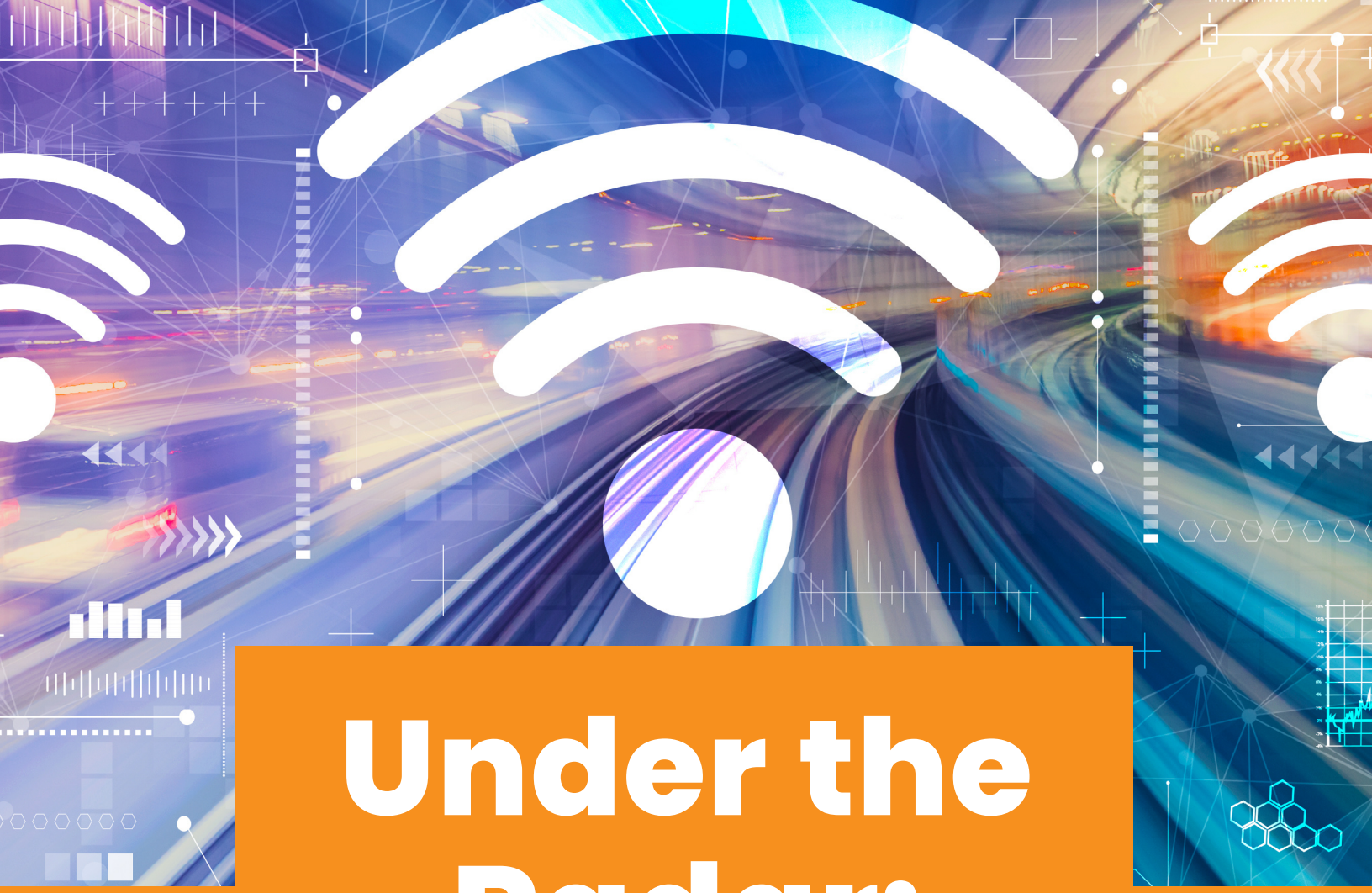

Under the Radar:

How the 3G Shutdown Puts Industries at Risk and Widens the Digital Divide

A RESOURCE AND TOOL KIT TO HELP INDUSTRY LEADERS NAVIGATE THE TECHNOLOGY TRANSITION

CETF
CALIFORNIA EMERGING TECHNOLOGY FUND

Presented by
CETF in collaboration with
Pacific Rim Advisory Group, LLC
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Overview

Cellular companies will begin the 3G-to-5G technology transition in a few weeks. To make room for the powerful bandwidth and infrastructure required for the 5G spectrum, the 3G network will be completely disabled, leaving enterprise customers and individuals, who rely on devices powered by 3G, in the dark.

The media messages and online content have been focused on the launch of the 5G network, rather than on the sunsetting of 3G, and the impact it will have the 43.7 million devices that will experience connectivity issues once 3G is shut down.

This document contains information intended to create awareness and inform readers on the details of the transition. It presents research on the scope of devices in numerous industries that rely on 3G and may experience potential repercussions from the 3G shutdown.

The problems are identified, and an accompanying executive tool kit will provide solutions in the form of actionable strategies and tools to assess and mitigate organizational risk.

This content may inspire readers to start dialogues with community leaders, businesses and individuals in California and beyond, leading to collaborations that will prepare communities for the 3G shutdown. It may also raise more questions: What will become of the obsolete devices? How do residents with fixed and low-incomes upgrade equipment?

Businesses leaders may want additional information or need assistance with assessing their risk. Pacific Rim Advisory Group can help.

Introduction

There are more than 4.66 billion active internet users worldwide[1], spending just under seven hours a day online[2]. Millions of everyday devices used by businesses and individuals rely on internet connectivity, and thus, require access to a network. This year, the 3G network, is being shut down to provide infrastructure and bandwidth for the 5G network. Recent media attention and marketing messages from national cell carriers have focused on the launch of the faster, more reliable 5G network, but few have explained that this technological transition will result in the **shutdown of the 3G network**. Individuals and businesses may be caught off guard beginning in February, when cell carriers flip the switch and third generation (3G) devices stop working.

The national carriers have been upgrading customer devices in preparation for the move–Verizon says less than one percent of its customers use 3G phones[3]. The following research reveals that **smaller telephone companies, small business owners and individuals are vulnerable to risks associated with the 3G shutdown.**

There are an estimated 43.7 million devices still in use that rely on 3G for mobile data capabilities[4]. When 3G is retired this year, those devices will no longer have internet connection, causing shutdowns that could be more significant than the inconvenience of not having cellular service for data or voice functionality. Disruption to distribution chains, loss of data and disarming of security systems could present serious consequences to businesses, and loss of 911 access for individuals could be life threatening. With awareness campaigns, community and industry dialogue, and the sharing of mitigation resources, these risks that can be minimized or avoided altogether.

[1] statista.com | [2](DataReportal, 2021) | [4]WMMT, Kalamazoo | [4]FCC

3G is shutting down

Our reliance on technology and the Internet of Things (IOT) is unprecedented, and as the communications industry makes another major shift to make information available at faster speeds, there are businesses and individuals who will be left behind. When the 4G spectrum was introduced, most cell companies provided backward capability, so equipment running on 3G would still function. The launch of 5G in 2022 will be different because the 3G spectrum is shutting off completely, and this will create more challenges for those who have equipment that relies on 3G technology.

Projected 3G Shutdown Dates

Are you prepared?

AT&T	February 2022
Sprint	March 2022
Verizon	December 2022
T-Mobile	July 2022

Older cell phones (pre-2010) 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).

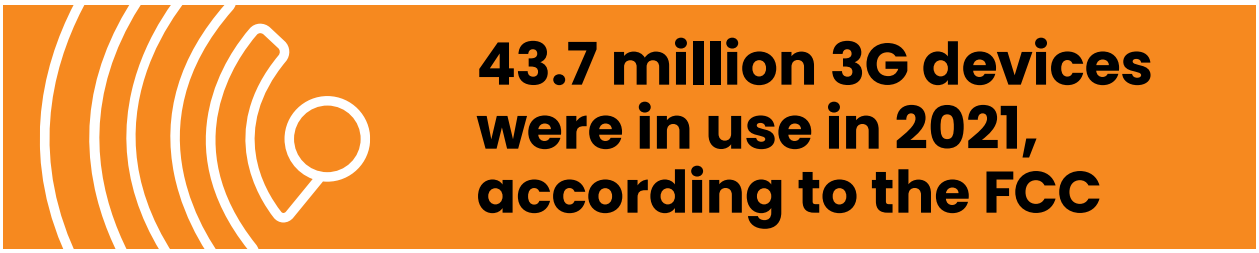
The Big 4 national carriers have informed customers about the 3G retirement

All of the national celluar carriers have information available on their websites for customers and list equipment that will no longer be functional after the 3G shutdown. Most customers will need to perform a software update, install a new SIM card or upgrade their mobile devices.

This is more than a cell phone issue

While older model cell phones will be affected, **many products, used by individuals and businesses rely on 3G technology**–Siren Operated Systems (SOS) in vehicles, medical alert devices and security gates; tablets used in the transportation and distribution industries; home alarm systems; monitoring devices used by law enforcement to monitor alcohol levels and individuals confined to homes; GPS technology found in farm equipment and school buses.

This document will help individuals and enterprises, large and small, **understand and assess the risk**, as well as make a plan to navigate the impending technology transition. For more information, explore the resources listed in this document or contact California Emerging Technology Fund at www.**CETFUND/3G.org**.



3G-Powered Devices

- Fire Alarms
- Home Security Systems
- Medical Devices
- Personal Alarms
- Ankle Monitors and Other Offender Management Devices
- Vehicle SOS Services and Remote Features
- Wi-Fi USB Adaptors
- Mobile Hotspots
- Garage Door Openers
- Keyless Car Entry/Start
- Portable Internet Hotspots
- Alcohol Monitoring Devices
- Telematics Systems
- Classic Chromebooks
- E-readers
- Modems

A wide swath of enterprises use 3G devices that perform safety and systems-critical functions like transferring data, controlling alarms, monitoring distribution chains and tracking people and merchandise that are essential to daily commercial and industrial operations. Below are just a few examples:

- Automobile
- Aviation
- Agriculture
- Law Enforcement
- Medical
- Security
- Transportation
- Trucking
- Waste Management

What industries are vulnerable?

This 5G conversion will affect vehicles and trucks that use GPS, cellular communications, keyless entry and start, and other subtle feature functions. It may also affect Smart Home and Office technologies such as garage doors, gated areas, appliances, and environmental controls that use cellular technology. Law enforcement also uses devices connected to 3G networks including alcohol monitoring equipment and ankle bracelets. Medical alert devices may also be affected by the transition.

How are businesses preparing?

While cell phone providers have been able to execute their conversion plans by upgrading customers, other service providers have cited obstacles to their efforts, due to COVID 19 and the inability to access homes and businesses to replace and upgrade equipment. Compounding these delays are the international supply chain problems that are making it difficult to acquire and distribute replacement equipment.

While some are calling this a lost year caused by COVID 19 and supply chain issues, some businesses are contacting customers based on the equipment needs. Others, such as medical alert providers, are proactively sending new, compatible equipment directly to customers.

Identifying the method of connectivity – and then the compatibility of devices and services – are important first steps in the mitigation process.

We have identified three methods used to connect devices to services: cellular, landline, and internet. Understanding how specific devices or services are connected will eliminate unaffected products and highlight those in need of further investigation or action, since it is only the 3G cellular service affected with this network change.

When it comes to devices that connect via cellular service, there are two groups, those managed internally, and those managed externally. Internal managed cellular services are best described as those services for which the organization receives a billing statement directly from the cellular provider, Verizon, AT&T, T-Mobile, etc. Whereas externally managed services are those services for which the organization pays a third party; these might include medical alerts, alarm systems, for example.

The widespread reality of the shutdown

Law Enforcement

Imagine a day ankle monitor systems worn by hundreds of criminal offenders on parole shuts down throughout the county. If 3G eqipment like these monitors and alcohol monitoring devices used by law enfocement quit functioning, what would be the impact on communities?

Nonprofit

Community-based organizations often provide cellular phones to clients in vulnerable situations so they have access to 911 services. Most of these devices will not work once the 3G network shuts down. What will be the repercussions?

Transportation

Fleet managers are using electronic logging devices that are on 3G networks. If they stop working, how will this affect an already stressed supply chain?

Agriculture

Large machinery is expensive and can be kept in use for decades. Like automobiles, farm equipment older than 2010 has GPS or other technology that requires internet connectivity, typically through the 3G network. It will lose connectivity after the 3G shutdown. What will this do to the food distribution chain and the price of fresh produce?

Seniors and the less advantaged are at risk

The world has navigated multiple technological transitions in the past three decades. Many older citizens are hesitant about upgrading devices, and consumers with fixed or low-incomes are also at a disadvantage during these transitions, and in 2022, millions of people at risk of being left in the dark with the sunsetting of 3G.

Seniors who have legacy communication devices – not necessarily flip phones, but models made before 2010 and some up to 2012 – will no longer have the ability to make calls to 911 or to neighbors in the event of an emergency. Medical alert devices, owned by millions of elderly citizens living alone, run on 3G, and unless they have followed the instructions provided by manufacturers, older relatives may be vulnerable if they need help. Trac phones are often distributed by social services and nonprofits to people who are homeless as a way to reach 911; these will no longer function when 3G shuts down.

Those who own cars that are beyond warranties, or second-generation car owners, may have missed recalls by car manufacturers. Many people living in rural areas or developing countries who are using older technology will be affected by this transition and left without a lifeline to emergency services.

CONCLUSION

This year, 3G will retire, potentially causing disruptions in daily activities for individuals and enterprises. Time is of the essence to properly capture appropriate information to assist companies, agencies, and individuals to understand what is happening, how to prepare, and how to respond to ensure continuous service with no down time to critical services or activities.

As with every significant technology shift there is pain but also opportunity. Many organizations continue to use older technology because it works, and it is low priority. The 3G shutdown is a forced upgrade that offers a suitable opportunity to review all cellular connected technology for best fit and expense management. Many times this will result in more efficient and effective equipment and processes, which will deliver greater overall value for the organization.

The following resource, Executive Tool Kit: Assessing and Mitigating Risks associated with the 3G Shutdown, will help executives quickly assess whether there are any potential risks to their organization. The kit focuses on the pragmatic, management concerns and solutions rather than on technical issues. Because the challenges and opportunities vary widely from enterprise to enterprise, the tools provided will assist in the individual assessment and planning process.

What can be done immediately? First, contact your mobile provider or look at its website for individual shutdown plans and whether your phone, or another connected device, will be affected. If it is, you may need to upgrade to a new device in order to stay connected. The FCC recommends asking your carrier about a free or discounted upgrade to help consumers with older models. Individuals can contact manufacturers, explore their websites and talk to Internet Service Providers for guidance. Reach out to family and friends who use medical devices and older technology and share your knowledge and the shutdown dates. Technology is overwhelming for older generation. Patience and preparation will help make the transition smooth and keep family and friends safe in the years to come.

California Emerging Technology Fund

Closing the Digital Divide by accelerating the deployment and adoption of broadband to underserved Californians for 16 years

Since its founding in 2007, the California Emerging Technology Fund (CETF) has been on a mission over the last decade to forge partnerships and foster public policy to close the Digital Divide. This work has been strategically-focused, results-oriented, and people-centered.

Its reserach and intiatives have elevated CETF as a statewide leader in civic leader engagement, venture philanthropy and grantmaking, public policy initiatives, public awareness and education and strategic partnerships. Within these areas, CETF has reduced the Digital Divide in California, leading to better educated, more informed Californians across all socio-economic spectrums.

CETF
CALIFORNIA EMERGING TECHNOLOGY FUND

- Sponsored the Internet For All Now Act of 2017 to add $330 million for broadband deployment and adoption
- Secured the Governor's Executive Order on Digital Literacy
- Designed and managed School2Home, scaling to 12 districts
- Founded and funded the California Telehealth Network and 35 schools to serve more than 14,000 students and 600 teachers
- Led several projects to connect residents in publicly subsidized complexes;
- Developed model policies for smart communities, including promoting broadband as a "green strategy" to reduce impacts on the environment
- Our network of more than 100 grantees has delivered digital literacy training to more than 800,000 residents and got more than 250,000 low-income households online

cetfund.org

ADDITIONAL RESOURCES

FCC
https://www.fcc.gov/consumers/guides/plan-ahead-phase-out-3g-cellular-networks-and-service

Global Positioning
Types of GPS Tracking and How They Work | GoFleet Tracking

Cellular Service
AT&T
https://www.att.com/support/article/wireless/KM1324171/

Verizon
https://www.verizon.com/support/knowledge-base-218813/

T Mobile & Sprint
T-Mobile Network Evolution | T-Mobile Support

BY INDUSTRY

Agriculture

Data Management | JDLink™ | John Deere US
MF Connect (masseyferguson.com)
Cat Technology for Construction Industries | Cat | Caterpillar

Automotive

The Car Industry Upgrades To 4G: How Automakers Are Preparing - Forbes Wheels
3G Shutdown: Is Your Car About to Become Obsolete? (makeuseof.com)
Upgrade Connected Features on Your Older-Model Ford with New FordPass SmartLink™, Available Nationwide Mid-2018 | Ford Media Center
Search Results - BMW North America (bmwusa.com)
How do I contact Chrysler? (force.com)
3G Network Retirement | Subaru STARLINK Safety & Security
https://www.toyota.com/audio-multimedia/support/3g-faq/

ADDITIONAL RESOURCES

Aviation

U.S. FAA details 50 airports that will have 5G buffer zones | Reuters

Law Enforcement

Electronic Monitoring - Offender Management (offender-management.com)

Medical Alert Service

3G Sunset Will Leave Millions of Medical Alert Users at Risk. - Hands Free Health

Security Monitoring & Alarm Services

Convert Your ADT Home Security System to 4g LTE Today!
Matson Alarm | Security Systems | Alarm Systems | Alarm Monitoring
Bulldog Alarm Company | Home
Valley Security & Alarm | Business Security Solutions (valleysecurityandalarm.com)

Smart Homes and Businesses

Vivint | Smart Home Automation and Smart Home Security
Safewise (frontpointsecurity.com)
Smart Alarm Systems & Home Security | SimpliSafe
Self-Installed DIY Home Security Systems | Cove Security (covesmart.com)
ADT Monitored Home Security Systems | ADT Monitored Security Systems for Your Home | SW-A - SafeStreets
Nest Smart Doorbell Cameras - Google Store
Video Doorbells | Smart Doorbell Cameras to Monitor Your Door | Ring

Executive Tool Kit

Assessing and Mitigating Risks associated with the 3G Shutdown

Questions Managers Should be Asking

- What technology uses 3G that will not be 5G compatible? Or, what is 5G compatible?
- What will be critical and not merely inconvenient?
- How will the specific provider shutdown timelines affect geographies in which we do business?
- If one provider's roll-out is more aggressive, can the business stall by changing providers?
- If updates are not available, will the organization replace existing technology?
- If replaced, what updated features and functionality will increase?
- Will the entire system be replaced or just critical components?
- What is the cost of updating vs. the cost of replacement?
- What will product availability and lead times be during the current supply chain challenges?
- How should we assess our current products and evaluate update vs. replacement options?
- What can be "swapped out" by in-house personnel vs. what requires expert technicians? What will the demand for (and availability of) these trained technicians be like as the deadlines approach?
- What approach should management take to create temporary solutions if the forthcoming updates or replacements are delayed?

FIVE-STEP PROCESS TO ASSESS ORGANIZATIONAL RISK

1. **Identify devices and services**
   a. Internally Managed
   b. Externally Managed

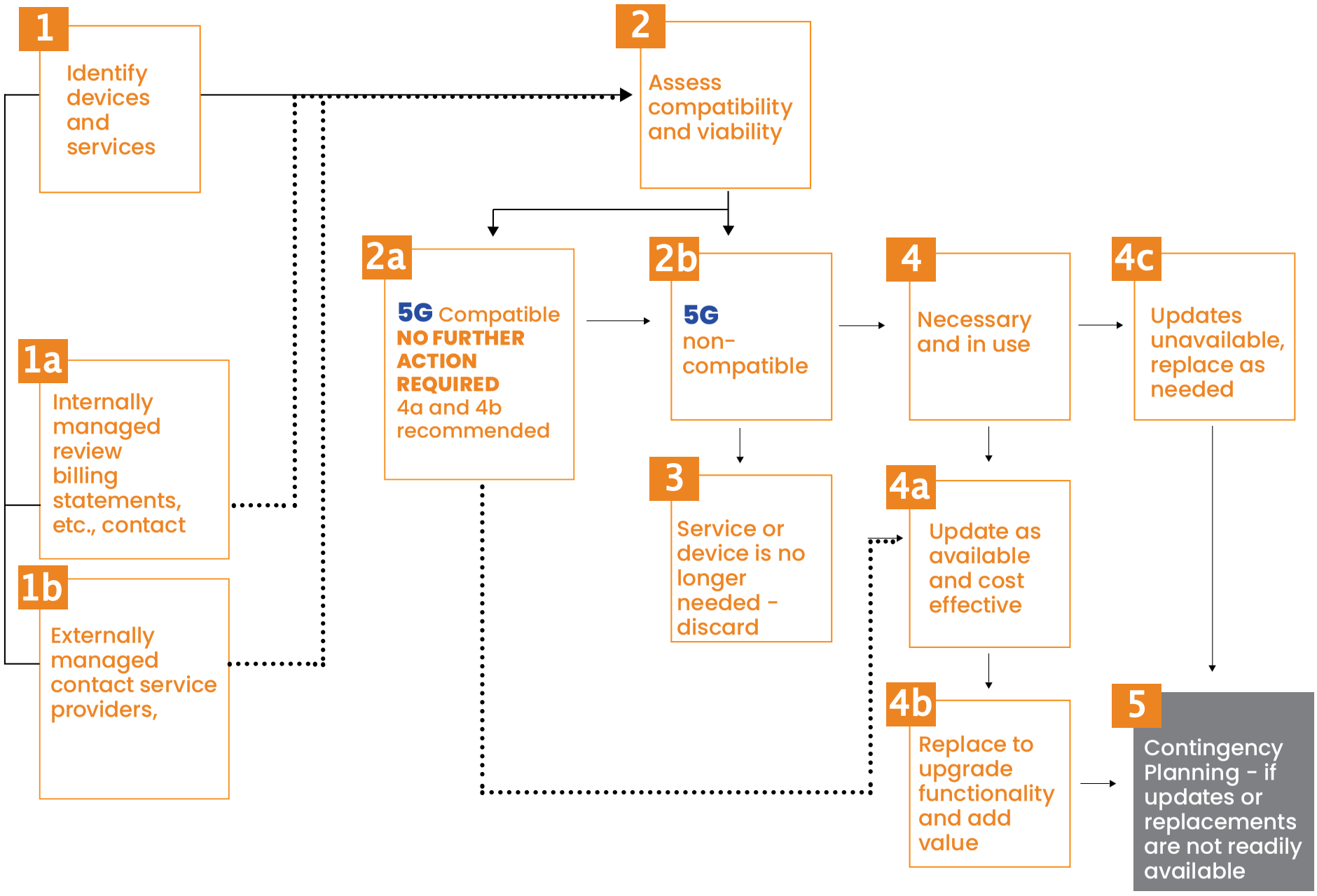
2. **Assess compatibility and viability**
   a. 5G Compatible
   b. 5G Non-compatible

3. **If no longer needed, discontinue the service or discard the devices**

4. **Means of disposal**
   a. Update as available and cost effective
   b. Replace to upgrade functionality and add value
   – If updates are available, replace as needed

5. **Contingency Planning – use templates provided in this tool kit**

FIVE-STEP PROCESS TO ASSESS ORGANIZATIONAL RISK



Contingency Planning Process

A contingency plan assumes that the device and/or service in question will not be available when the 3G network is shut down This disruption may be temporary or permanent.

- Business purpose or function including task(s) and expected outcome(s)

- How will this impact the operation?
    - Function levels– convenient, efficient, information, critical
    - End user(s)
        - Internal – Example payroll, transportation management, etc.
        - External – Example customers, government agencies, etc.
- Inventory
    - Currently in use
    - Temporary solution

- Alternate source or process

- Any pre-cellular processes or procedures
    - Manual recording, etc.
    - Temporary device usage – existing, purchase, rental, or lease
    - Cost estimate

- Resources required
    - Devices or other equipment
    - Personnel to manually process, etc.

- Staffing requirements
    - Assign to current staff
    - Reassign staff and dedicate to function
    - Hire additional staff
    - Outsource – may be preferable if solutions are temporary in nature
    - Cost estimate

Contingency Planning Template

Service or device desription

Business Purpose or Function Description

How will the contingecy plan impact the business?

Function Level	Alternate Source or Process

Inventory

Currently in Use		Required for Temporary Solution				
Description	Quantity	Description	Quantity	Expense Period	Cost	Extended
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Resources Required	Staffing Requirements				
	Description	Staff Assigned	Expense Period	Cost	Extended
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -

Completed Example

Service or device desription

Delivery trucks are currently equipped with cellular enable tablets.

Business Purpose or Function Description

These tablets provide stop sequenced, route navigation, realtime delivery tracking for customers via app, driver communication to dispatch, and transportation management insights.

How will the contingecy plan impact the business?

All current functions will be unavailable when 3G networks are offline. This contingency plan will enable all the above functions with the expection of realtime tracking and supervisor progress viewing.

Function Level	Alternate Source or Process
Convenient Efficient Informational	Upgraded replacement tablets are on back order with an expected 6 month lead time. This requires a temporary solution. By leasing 5G smart phones our route drivers will have navigation and communication functions. Communicating route progress will be managed via text and customers will be notified by phone of any delivery delays and status.

Inventory

Currently in Use

Description	Quantity
Samsung 3G tablets	95

Required for Temporary Solution

Description	Quantity	Expense Period	Cost	Extended
Verizon cell service lines	95	Monthly	$ 32	$ 3,040
I phone 7 lease	95	Monthly	$ 15	$ 1,425
				$ -
				$ -

Resources Required

Since the iphone solution will not provide tracking all status communication from driver to dispatch, and dispatch to the customer will be a manual process. In addition to the devices and services listed above some staffing changes / additioans will be required to provide continued communication and service to customers.

Staffing Requirements

Description	Staff Assigned	Expense Period	Cost	Extended
Cust Service rep - dispatch (2 shifts X 6 days)	Reassign staff and dedicate to function	Weekly	$ 1,920	
trainee customer service	Hire addl staff	Weekly	$ 800	
Cust Service staff OT	Assign to current staff	Weekly	$ 200	