


ANNEX A TO APPENDIX 15
(IMPACTS TO COMMUNITY LIFELINE SECTORS)
TO THE SOUTH CAROLINA EMERGENCY OPERATIONS PLAN


I. INTRODUCTION



The following table and flowcharts describe important considerations following a long-term power outage (LTPO) to the state's community lifeline sectors. Neither is meant to contain an exhaustive list but can provide a starting point for consideration at the beginning of the incident.


- A. A sample list of possible impacts, critical information requirements, and potential decision points are included in Table 1.
- B. Flowcharts beginning on page 7 outline the anticipated cascading effects from an LTPO to each of the lifeline sectors.



Table 1: Lifeline Impacts, Information Requirements, and Decision Points


Lifeline	Scope of Possible Impacts	Critical Information Requirements	Potential Decision Points
	<ul style="list-style-type: none">• The ability to maintain critical emergency services during disasters will be impeded due to cascading impacts from communications failure, lack of clean water, and impacts to the transportation sector.• An increase in house fires is possible from improper use of generators.• Water utilities may not be able to provide proper water pressure for fire suppression.• Commercial and residential security/alarm systems without battery backup will not work.• The inability to pump fuel will impact responder vehicle fleets.• Impacts to responder communications will affect ability of dispatch to coordinate response.	<ul style="list-style-type: none">• Cascading effects on government facilities that support mission essential functions• Status of backup first responder communications systems in the impacted area• Status and duration of backup generators in government facilities	<ul style="list-style-type: none">• Identification of priority infrastructure in need of generators/fuel• Prioritizing resources to support continuity of government and continuity of operations

Lifeline	Scope of Possible Impacts	Critical Information Requirements	Potential Decision Points
	<ul style="list-style-type: none"> • Additional security personnel will be needed to manage traffic at non-functioning signals, escort fuel shipments, and/or secure critical facilities. • Security/controlled access systems without backup power will need additional support to properly secure government buildings/other secure areas. 		
	<ul style="list-style-type: none"> • Mass care needs will increase each day as more people lack electricity, food, and/or water. • Transportation limitations and supply chain disruptions will make it difficult to open shelters, prepare food, distribute food and emergency supplies, and provide means for reunification services. • Disruption in agribusiness is likely and includes production, harvest, manufacturing, and retail. This will have cascading impacts on employment, tax revenues, and commerce. • Disruptions in agribusiness may cause loss of availability to human food, animal feed, and non-food agricultural products (including forestry and timber products). • Impacts to temperature-controlled facilities related to human food and animal feed may cause increased challenges for maintaining public health and animal health standards for those commodities. 	<ul style="list-style-type: none"> • List of impacted facilities and any associated disruptions or loss of capacity • Amount of time until operations can resume following restoration of power and interdependent sector services (e.g., water) • Location, accessibility, and capacity of open or planned shelters • Cascading effects in supply chains • Estimates on how long food/ water supply would last • Disruption in agribusiness supply chains and projected economic and community impacts • Community accessibility to safe food supply 	<ul style="list-style-type: none"> • Identification of priority infrastructure in need of generators/fuel, including medical needs shelters • Opening of shelters • Threshold for disruptions in food supply chain • Threshold for economic impacts related to disruption in agribusiness • Identification of congregate feeding sites.

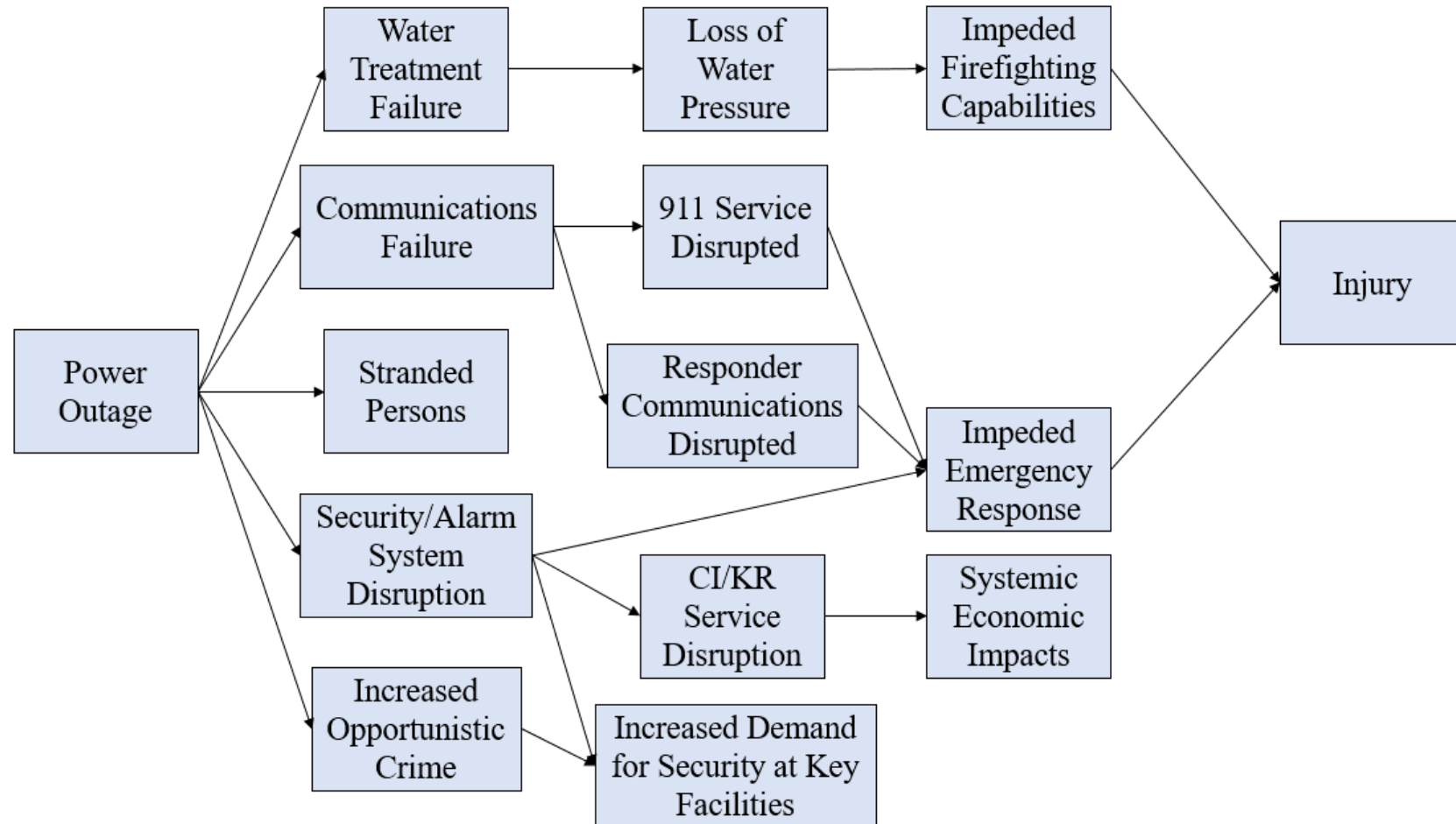
Lifeline	Scope of Possible Impacts	Critical Information Requirements	Potential Decision Points
	<ul style="list-style-type: none"> • Loss of clean water and lack of fuel for generators will lead to degradation of critical medical functions. • The ability to use power-dependent durable medical equipment, to include oxygen concentrators, without electricity is limited. • Access to medical records is diminished. • Access to critical pharmaceuticals is diminished. • Improper use of generators may lead to an increase in burns, carbon monoxide poisoning, and other related health impacts. • Increased rates of illness and other public health impacts due to the potential lack of availability of potable water, environmental impacts, clean water for hygiene and sanitation, sanitary food preparation tools (cooking), and other related mechanisms of mitigating ingestion and exposure to pathogens. 	<ul style="list-style-type: none"> • Status and duration of backup generators to keep facilities running • Status of facility access to clean water and wastewater services. • Status of medications and medical supply • Status of medical facilities that are open for what services • Availability of mental health resources • Morgue availability • Response and transport times for patient movement • Fuel distribution plans 	<ul style="list-style-type: none"> • Identification of infrastructure in need of generators/fuel to include water and wastewater facilities. • Initiation of patient movement plans
	<ul style="list-style-type: none"> • Bulk electric system will fail. • Fuel will need to be prioritized for distribution and use based on requirements such as the number of available generators, number of facilities requiring fuel or generators, and fuel consumption. • Pipeline operations may be degraded due to limitations in backup power. • Few gas stations and no fuel terminals have backup power for their fuel pumps, hindering the refuel of vehicles for the public and first responders. 	<ul style="list-style-type: none"> • Updates on restoration progress • Status of terminals/fuel stations • Status of restoration times 	<ul style="list-style-type: none"> • Fuel delivery priorities • Utilities: Prioritization for restoration • Utilities: Initialization of black start capabilities

Lifeline	Scope of Possible Impacts	Critical Information Requirements	Potential Decision Points
	<ul style="list-style-type: none"> • Damage to certain components of the electric transmission system from loss of power or from secondary hazards could delay power restoration efforts and cause longer estimated restoration time-lines due to significant just-in-time supply chain issues 		
	<ul style="list-style-type: none"> • System operators would likely not be able to maintain telephone, cellular, email, or dedicated broadband networks for communications. • Communications backup power systems may fail with an extended loss of electricity. • Local radio and tv stations may not be able to broadcast, requiring the Joint Information Center (JIC) to identify non-traditional methods for providing public messaging. • Delays in restoration of communications infrastructure are possible if the LTPO is caused by a hazard that also led to debris/damage. 	<ul style="list-style-type: none"> • Status of 911 system and dispatch • Backup communications systems in the impacted area • Ability to route communications through other areas/regions • Communications priorities/needs for mass care and emergency assistance, evacuations, and re-entry • Fuel distribution plans 	<ul style="list-style-type: none"> • Identification of priority infrastructure in need of generators/fuel • Communications resource priorities to support continuity of government, command and control, and public alerts and warning • Highway regulation suspensions to allow rapid delivery of commercial communication restoration capabilities

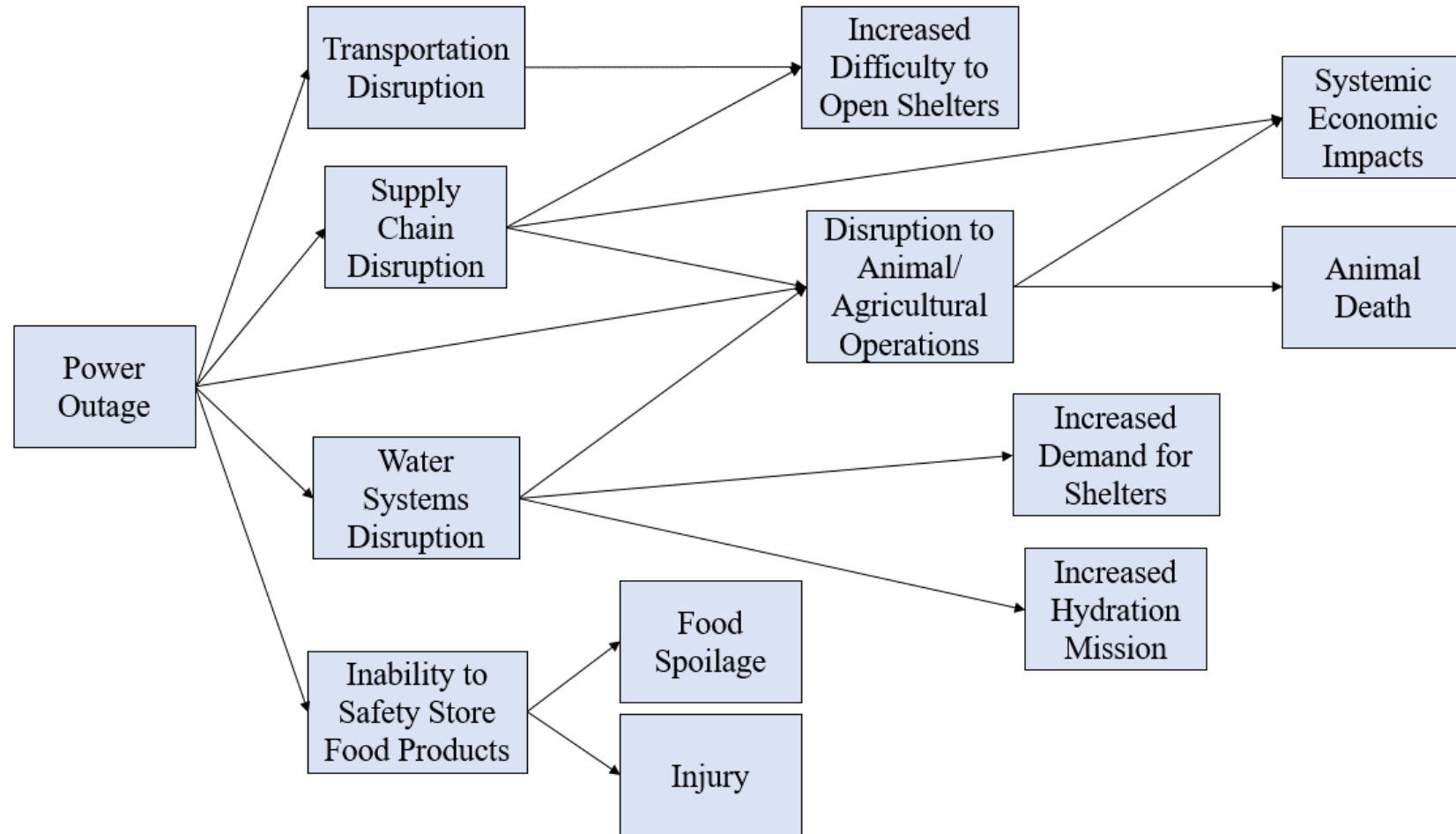
Lifeline	Scope of Possible Impacts	Critical Information Requirements	Potential Decision Points
	<ul style="list-style-type: none"> • Traffic signals may be non-functioning, causing congestion on roads. • There will be limited to no power for railroad switching and signals. • The ability to manipulate movable bridges will be lost; movable bridges will remain in the position they were at the start of the power outage. • Transportation management systems will be affected and will inhibit consumer and commercial movement. • Traffic cameras and other surveillance tools will be inoperable. • Public transit and airports will lose ticketing and check-in abilities. 	<ul style="list-style-type: none"> • Transportation infrastructure status • Community support needs and transport requirements • Available transportation resources • Determined staging areas for relief operations 	<ul style="list-style-type: none"> • Identification of priority infrastructure in need of generators/fuel
	<ul style="list-style-type: none"> • Direct impact on HAZMAT/chemical facilities located in the region is expected, including impacts to HAZMAT/chemical shipments. • Offsite power to nuclear plants would be lost. • Any facility requiring cooling would lose access to water supply. • Environmental issues that occur due to a long-term loss of power may include water contamination. • Power outages and possible subsequent fuel shortages may impact the ability of municipalities to coordinate refuse pickup. • Autoclaves for treatment and disposal of infectious waste will be inoperable in facilities without power. 	<ul style="list-style-type: none"> • Status of nuclear power plants in the impacted area • Status of HAZMAT/ chemical facilities in impacted region • Status of the power grid, to determine if nuclear power plants can continue to generate power or go into a controlled shutdown • Status and duration of backup generators in facilities • Cascading effects on other facilities that are dependent on goods or materials provided by the affected facilities 	<ul style="list-style-type: none"> • Identification of priority infrastructure in need of generators/fuel • Prioritize shipments of sensitive material needed to restore power • Nuclear Regulatory Commission (NRC) regulations trigger controlled shutdown using onsite power

Lifeline	Scope of Possible Impacts	Critical Information Requirements	Potential Decision Points
	<ul style="list-style-type: none"> • Standard reporting mechanisms for hazardous spills may be unavailable due to loss of communications. • Water utilities may not be able to provide proper water pressure for fire suppression. • The inability to pump fuel will impact responder vehicle fleets. • Impacts to responder communications will affect the ability of dispatch to coordinate response. 	<ul style="list-style-type: none"> • Fuel distribution plans • Reporting of spills/releases 	
	<ul style="list-style-type: none"> • Water and wastewater utilities will be hindered as many have limited backup power, leading to potential impacts on water pressure and supply. • Even after power is restored, some systems may need repairs before they can be turned back on. • Any disruption to potable water sources for human and animal consumption, and access to clean water to use for appropriate sanitation and hygiene is a critical issue for public health, animal health, and food supply chains. • Impacts to private and public wells not part of a public utility are also expected. • Delays in restoration of water and wastewater infrastructure are possible if the LTPO was caused by a hazard that also led to debris/damage. • Environmental issues that occur due to a long-term loss of power may include water contamination. 	<ul style="list-style-type: none"> • Drinking water and wastewater utilities' supply of emergency generators, fuel, and treatment chemicals • Community accessibility to potable and clean water sources • List of utilities with boil water advisories • Fuel distribution plans 	<ul style="list-style-type: none"> • Identification of priority infrastructure in need of generators/fuel • Identification of priority treatment facilities to support other CI (water system that serves a hospital).

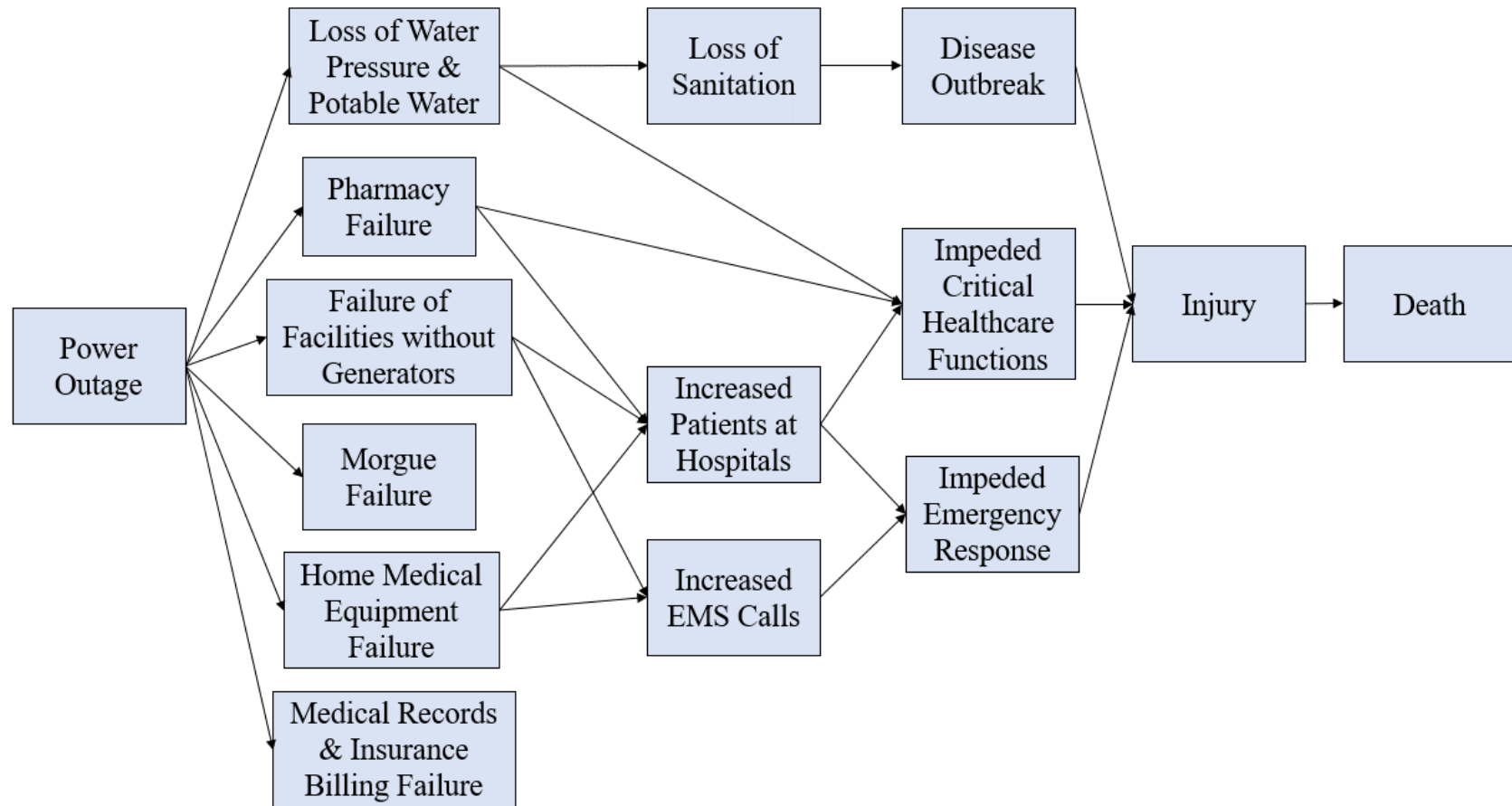
Safety and Security Lifeline



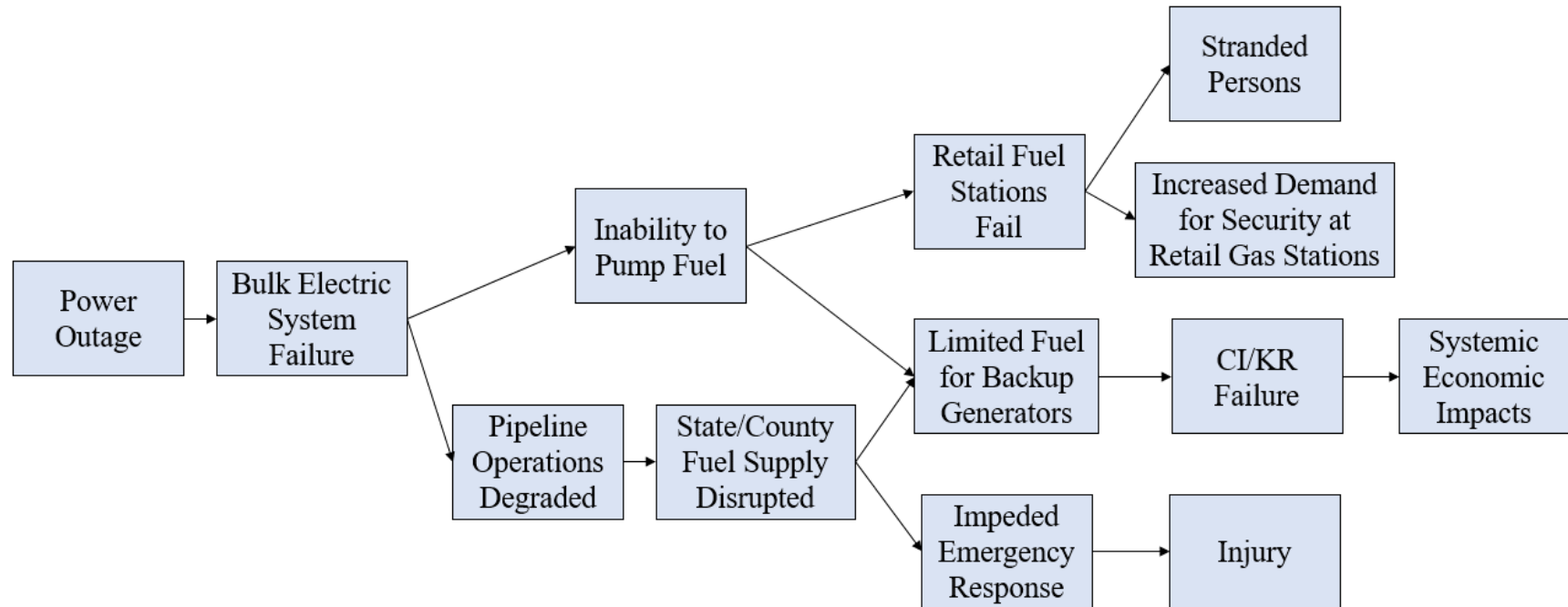
Food, Hydration, Shelter Lifeline



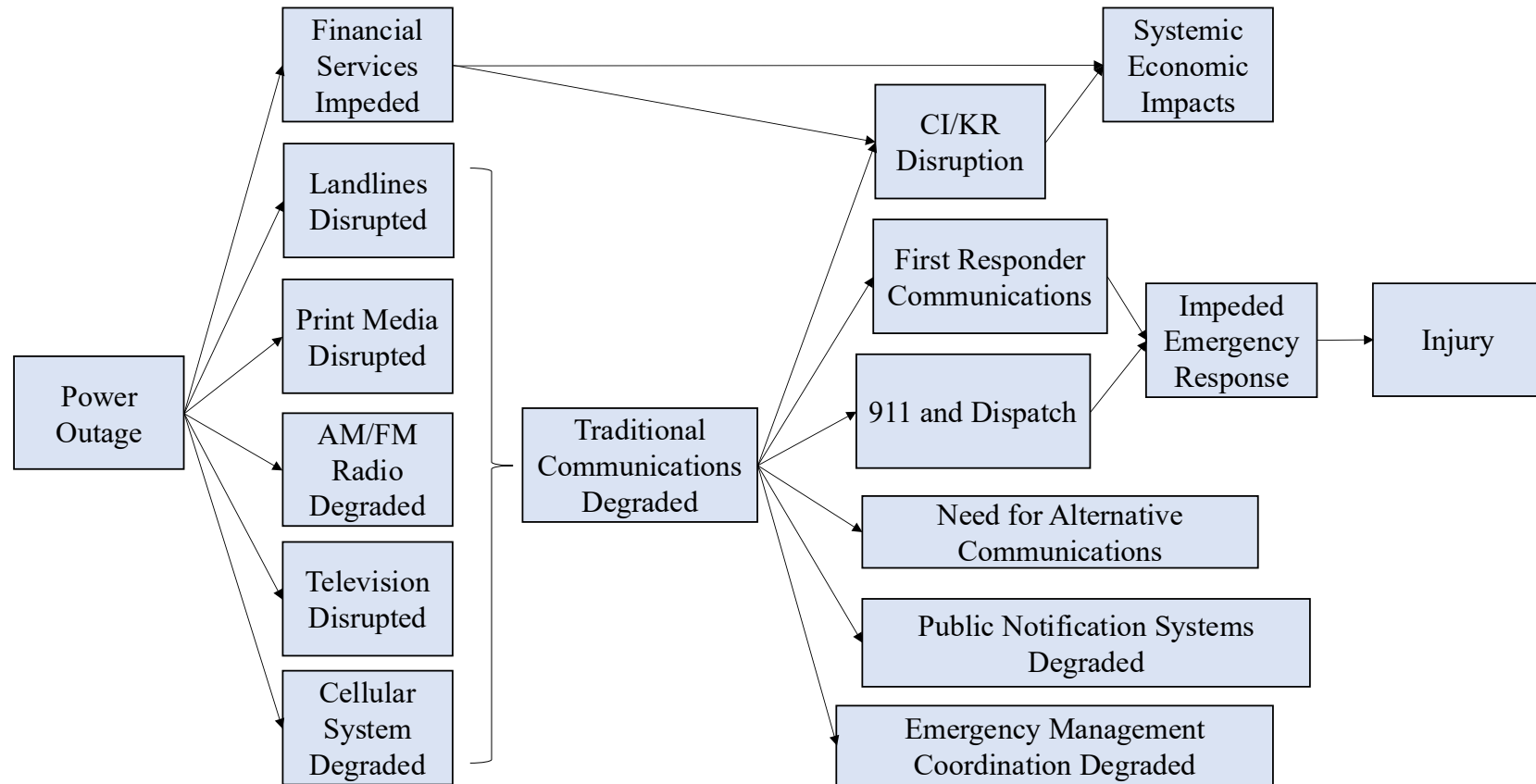
Health and Medical Lifeline



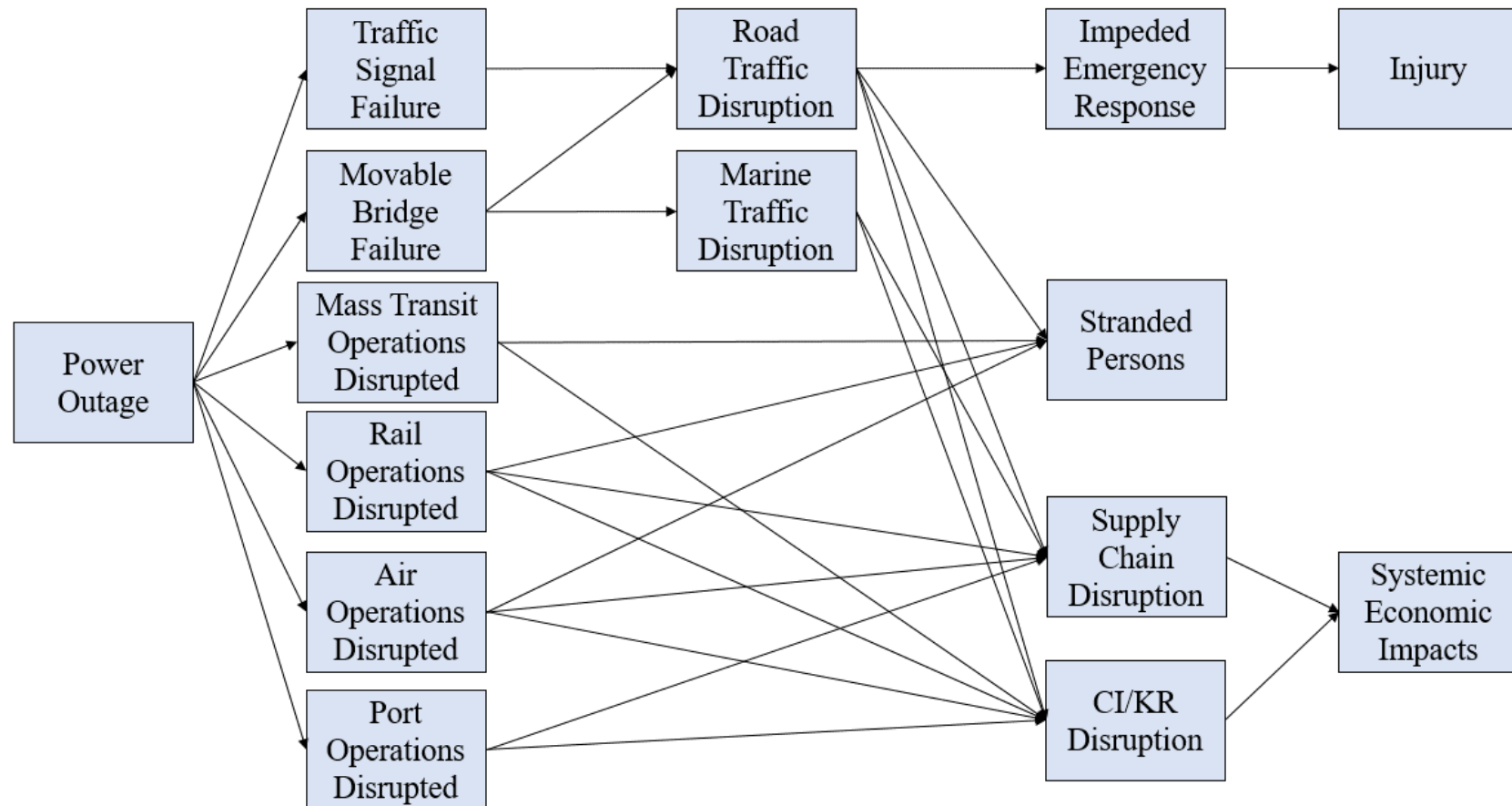
Energy Lifeline



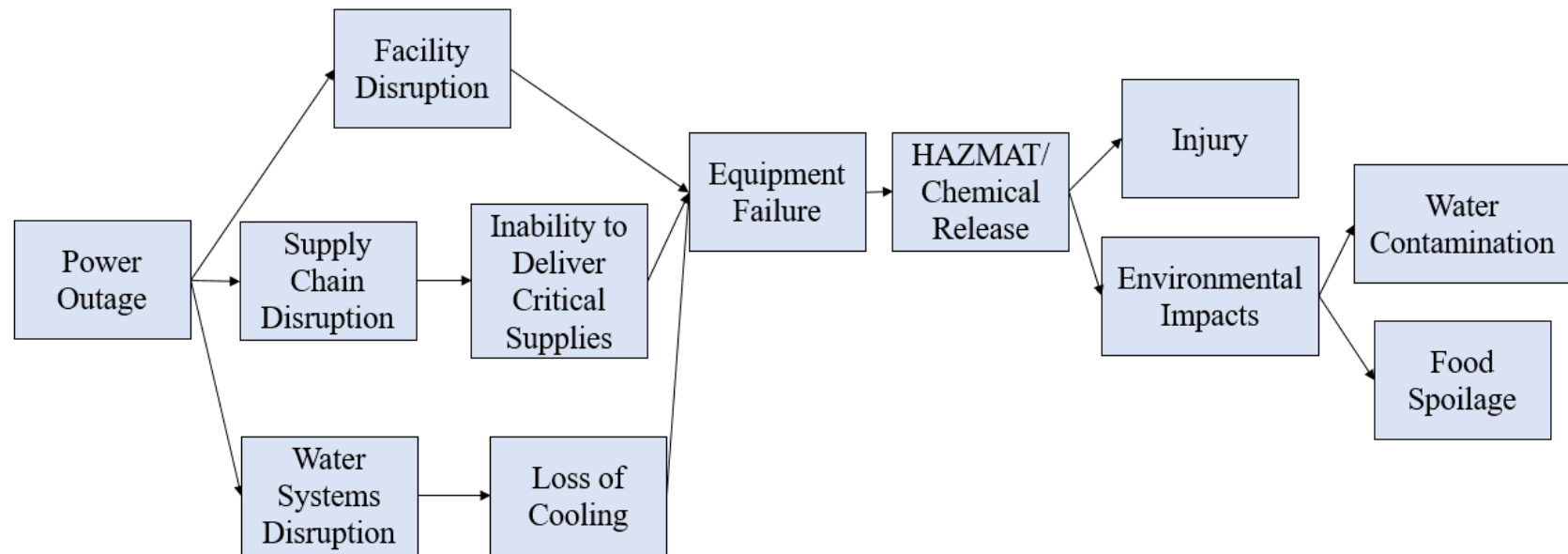
Communications Lifeline



Transportation Lifeline



Hazardous Materials Lifeline



Water Systems Lifeline

