



# Maine Community Risk Reduction Statewide County Community Risk Assessment

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## Executive Summary

This Maine Statewide County Level Community Risk Assessment (CRA) contains a community profile and incident data review. The profile consists of population, housing, infrastructure, and other sources of data. The data provides the reader with a picture of the community's people and area showing types of incidents first responders encounter in the community they serve.

Maine is the largest of the New England states. Its sixteen counties are 61% rural and it is the nation's most forested state. Its total population change is flat, but slowly increasing with Washington County's forecast to see the greatest percentage increase of 13.5% from 2020 – 2040. Piscataquis, Franklin, and Oxford counties are seeing the greatest percentage increases in net migration. An estimated 38% of the population lives in York and Cumberland counties. Maine is the nation's oldest state with a median age of 44.7. Rural counties have the greatest percentages of adults over the age of 65. In terms of race and ethnicity, Maine is mostly homogenous but is seeing more diversification in urban areas. Rural parts of Maine have higher poverty rates, lower median household incomes and educational attainment. Fifteen percent of Maine's population has a disability in contrast to the nation's 12.6%. Piscataquis, Washington and Aroostook counties have the greatest percentage of disabled people, both overall, and 65 years of age and older.

Maine, like its eastern neighboring states, has the oldest housing stock in the nation. Over half of Maine's total housing units were built either around or before 1939 or between 1970 and 1989. Housing, both owned and rented, has generally been unaffordable. For the most part, housing permits and starts have continued to rise since 2013. Not surprisingly, among many types of infrastructure, there are more nursing homes (1,110) than any other type of building followed by general manufacturing (788), and public schools (643). Cumberland, York, and Androscoggin counties lead the way in nursing home infrastructure with 810, 511 and 506 units respectively.

In terms of incident data, falls, motor vehicle crashes and poisoning are the leading causes of unintentional death and injury in Maine. In 2022, there were 33,925 crashes in Maine killing 186 people and injuring another 10,063 with a total estimated cost of \$1.4 million. Though the crash rate and injuries are higher in urban counties, fatality rates are higher in the more rural areas lead by Washington, Hancock and Aroostook counties, with speed being the primary contributing factor. Falls are another serious incident type resulting in an estimated 346 deaths in 2021 costing and estimated \$1.2 million. According to the United States Centers for Disease Control and Prevention, there were an estimated 80,000 falls reported in Maine in 2020. Most of these falls are among those 65 and older who accounted for 325 of the 346 fall related fatalities. Drug related poisoning accounted for 583 deaths at a cost of \$11.4 million. Most of these poisonings were fentanyl related. The county distribution data of falls and poisoning is not readily available. Overall, Maine Emergency Medical Services units had 1.3 million patient encounters from 2018 to 2022. Patient counts and rates follow county population rankings.

Structure fires remained the most frequent type of fire from 2018 – 2022 at 10,995 (48%), followed by vegetation fires at 4,902 (21%) and vehicle fires at 3,218 (14%). Historically, most structure fires occur within the home. In 2022, an estimated 79% of structure fires occurred in residential occupancies and 91% of those occurred in single or multi-family dwellings. An estimated 85% of civilian fatalities and 77% of firefighter injuries take place in a home. Adults 65 and older accounted for 36% of fatalities since 2011, which is lower than previous decades where 40% to nearly 60% were 65 and over. Fewer children are being killed and an increasing number of 30 – 64-year-olds. Older adults comprise a significant share of hot substances, objects, and fire/flame related injuries. Again, the vast majority of these were in a home. Most of these events take place in our most populated counties such as York, Cumberland, Kennebec, Androscoggin and Penobscot. However, the rate home fires per 1,000 people is greater in rural counties. Piscataquis County has the highest rate of 2.6 followed by Franklin County at 2.5, Oxford County at 2.2, and Washington County at 1.9. Most of these fires are accidental in character. In fact, rural counties rank the highest in the Red Cross Home Fire Risk Index. The leading cause of these fires is heating, followed by cooking. Fire fatalities in Maine rose for the first time during the decade of 2011 to 2020 reversing a decade-to-decade decline beginning in the 1970s. At the present rate, fire fatalities from 2021 – 2030 will be greater than 2011 – 2020. In 2023, there were 29 fire fatalities. Maine averages 650 wildland fires per year, destroying 550 acres. An estimated 79% of homes in Maine are located in a wildland urban interface.

There are more injuries, fire injuries and deaths occurring in urban areas, however the risk is often greatest in Maine's more rural areas. In these areas, adults 65 and older are being injured the most. The higher rate of disability among this population places them at the greatest risk of falls and fire related injuries and deaths. The open areas of rural Maine with higher speed limits makes it more dangerous for serious car crash events. Again, it's important to remember that MORE incidents will take place in urban areas, which are equally as costly as those in rural areas, from a per incident perspective.

In most of Maine, home falls and fires are the low hanging fruit in terms of Community Risk Reduction efforts and programming. Both of these types of incidents, and car crashes as well, can be mitigated by any one of combination of the five E's: engineering; education; enforcement; economic incentives; and emergency responses of a Community Risk Reduction program. Another problem, perhaps a hazard in itself, is the lack of public/social resources and first responders in Maine's rural areas. A problem that is continuing to grow. Conversely, these more abundant resources in Maine's more urban areas provide those first responders with a great number of potential partnerships that can help with mitigation efforts. As we continue to see warmer than average temperatures, and storms that bring down trees creating a large debris layer in our forests, the risk of wildland fires in the most forested state in the nation increases.

# Table of Contents

Click on an item in the TOC to go to the page. Click Return to TOC at bottom of a page to return to TOC

<u>Section</u>	<u>Page</u>
Executive Summary .....	1 – 2
Table of Contents .....	3
Diagrams, Maps & Tables .....	3 – 4
Introduction .....	5 - 6
Community Profile	
Geography .....	7
Demography	
1. Population, Age and Gender.....	7 – 10
2. Income and Poverty .....	10 – 11
3. Race, Education and Challenged Populations .....	11 – 14
4. Housing .....	15 – 17
5. Infrastructure and Target Hazards .....	18
Incident Data	
1. Fire .....	19 – 20
2. Home Structure Fires .....	20 – 25
3. All Incidents .....	25 – 26
4. Wildland Fire .....	27
5. EMS Calls .....	28 -29
6. Vehicle Crashes .....	29 - 30
7. U.S and Maine CDC Data on Unintentional Injury .....	30
8. Natural Disasters .....	30 – 31
Prioritization .....	31 - 34
Addressing These Priorities – The Maine Fire Service Crisis .....	34

## Diagrams, Maps, Tables and Figures

### DIAGRAMS

Diagram 1 Six Components of Community Risk Reduction .....	5
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### MAPS

Map 1 Population Density of Maine, 2020 .....	7
Map 2 Percent of Population 65 and Over CDC/ATSDR Social Vulnerability Index 2020 .....	9
Map 3 Percent Without HS Diploma, Table B6009, 2021 Census ACS 5-Year .....	12
Map 4 Percent with Disability, Table DP02, 2021 Census ACS 5-Year .....	13
Map 5 Home Structure Fires by Maine County, 2022, NFIRS .....	21
Map 6 Home Structure Fire Rate by Maine County, 2022 NFIRS .....	22
Map 7 Maine Fire Fatality Count and Rate p/10,000 NFIRS .....	23
Map 8 Red Cross Home Fire Risk Map Maine County, Red Cross .....	25
Map 9 Percent Housing Units Exposed to Wildland Fire, Northeast/Midwest State .....	27

TABLES

Table 1 Maine Population Outlook, Total Population and Projections for Counties ..... 8  
Table 2 Maine Population Outlook by Age ..... 8  
Table 3 Infrastructure, US DHS Foundation Level Data (HIFID) ..... 18  
Table 4 Home Fires by Cause by Maine County, 2018 – 2022, NFIRS ..... 24  
Table 5 Percent Incident Type Maine County, 2018 – 2022, NFIRS ..... 26  
Table 6 EMS First Impression Maine County, 2018 – 2022 ..... 29  
Table 7 Motor Vehicle Crashes, Maine Department of Transportation 2022 ..... 29 - 30  
Table 8 Unintentional Injury All Ages 2021 US CDC, WISQUARS ..... 30  
Table 9 Unintentional Injury Over 65 2021 US CDC, WISQUARS..... 30  
Table 10 Natural Hazard Risk, FEMA, National Risk Index ..... 31  
Table 11 National Center for Injury Prevention and Control, Injury Mechanism, 2021 Maine ..... 32

FIGURES

Figure 1 Maine Population Outlook 2023 Generations ..... 9  
Figure 2 Gender and Age, Table DP05, 2021 Census ACS 5-Year ..... 10  
Figure 3 Poverty Rate, Table S1703, 2021 Census ACS 5-Year ..... 10  
Figure 4 Median Household Income, Table S1903, 2021 Census ACS 5-Year, 2021 ..... 11  
Figure 5 Once Race Alone, Table P8, 2020 Decennial Census ..... 11  
Figure 6 Percent Type of Disability, Table S1810, 2021 Census ACS 5-Year ..... 14  
Figure 7 Percent Disability Over 65, Table S1810, 2021 Census ACS 5-Year ..... 14  
Figure 8 Selected Housing Characteristics, Housing Tenure, Table DP04, 2021 Census  
ACS 5-Year ..... 15  
Figure 9 Selected Housing Characteristics, Housing Stock Age, Table DP04, 2021 Census  
ACS 5-Year ..... 16  
Figure 10 Selected Housing Characteristics, Housing by Type, Table DP04, 2021 Census  
ACS 5-Year ..... 16  
Figure 11 Occupied Housing Single Householder, Table B11001, 2021 Census ACS 5 Year ..... 17  
Figure 12, Selected Housing Characteristics, Vacant Housing & Mobile Homes, Table  
DP04, 2021 Census ACS 5-Year ..... 17  
Figure 13 Fires by Incident Type, Maine 2018 – 2022, NFIRS ..... 19  
Figure 14 Fires by Incident Type, Maine County 2018 – 2022, NFIRS ..... 20  
Figure 15 Incident Types, 2018 – 2022, Maine County, NFIRS ..... 26  
Figure 16 EMS Incidents, First Impressions, Maine 2018 – 2022 ..... 28

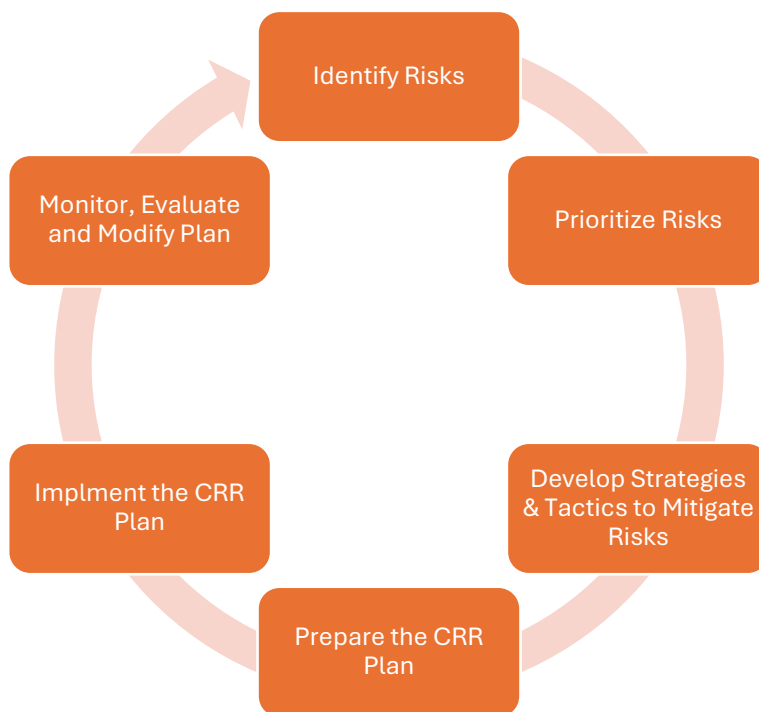
## Introduction

Community Risk Reduction (CRR) is a proactive and comprehensive approach to identifying, assessing, and mitigating risks in the community. It is a process already being used by many fire departments and other organizations across the nation to prevent emergencies from occurring; and to reduce the impact of those emergencies when they do occur.

CRR focuses on understanding the unique hazards and risks of a given community. This understanding is based on a Community Risk Assessment (CRA), which serves as an evaluation that identifies, prioritizes, and defines hazards and risks that pertain to a given community. Hazards and risks include structure and wildland fire incidents; hazardous waste and spills; bodies of water and drowning; street intersections and car accidents; and more depending upon the community. Prioritizing which risks a department focuses on in their CRR is based upon the frequency and impact of risks identified in the risk assessment.

The CRR plan revolves around six steps that provide a framework for setting goals and objectives. They are employed to reduce risks found in risk assessment.

Diagram 1





In 2023, the Office of the Maine State Fire Marshal formed an executive committee of fire service professionals to begin developing a Maine Community Risk Reduction plan with a mission to:

*Help build safer, healthier, and more resilient Maine communities by collaborating with risk reduction stakeholders and partners in Maine and across the USA to explore, adapt and implement best practices in evidence-based Community Risk Reduction, and achieve measurable and sustainable improvements.*

The first step in the Maine CRR plan, and all CRR plans, is to conduct a risk assessment. The Maine Statewide Community Risk Assessment will serve as both a source of information and a model risk assessment for local fire departments to begin identifying their own community risks.

The following Maine Statewide Risk Reduction Assessment was conducted by the Office of the Maine State Fire Marshal utilizing the following resources and others as primary resources.

- Maine Fire Incident Reporting System
- Maine Emergency Medical Services Data System
- Maine Department of Transportation
- Maine Office of GIS
- United States Census
- United States and Maine Centers for Disease Control
- Maine Emergency Management Agency
- Maine State Economist
- Maine Department of Agriculture, Conservation and Forestry

This assessment contains a demographic profile of Maine, and its counties, followed by an examination of fire and EMS incident data from the National Fire Incident Report System (NFIRS) for Maine and data from the Maine EMS data system. Other unintentional injury data is also included. The risk assessment does not include data on disease and/or natural mortality.

The assessment has been reviewed by the Maine Community Risk Reduction Collaborative (MeCRRC) Steering Committee who will review assessment to consider setting priorities and draft strategies to address risk in Maine. The CRA will lay the groundwork for local fire departments to work with stakeholders and related partners in their communities to develop their CRR plan.

The Office of the Maine State Fire Marshal, MeCRRC Executive and Steering Committee members will provide resources, tools and advocacy assistance to local fire departments to conduct a CRA and CRR plan to address their own community risks. In addition, the MeCRRC can develop and implement state directed programs.

# Statewide Community Risk Assessment

## Community Profile

### Geography

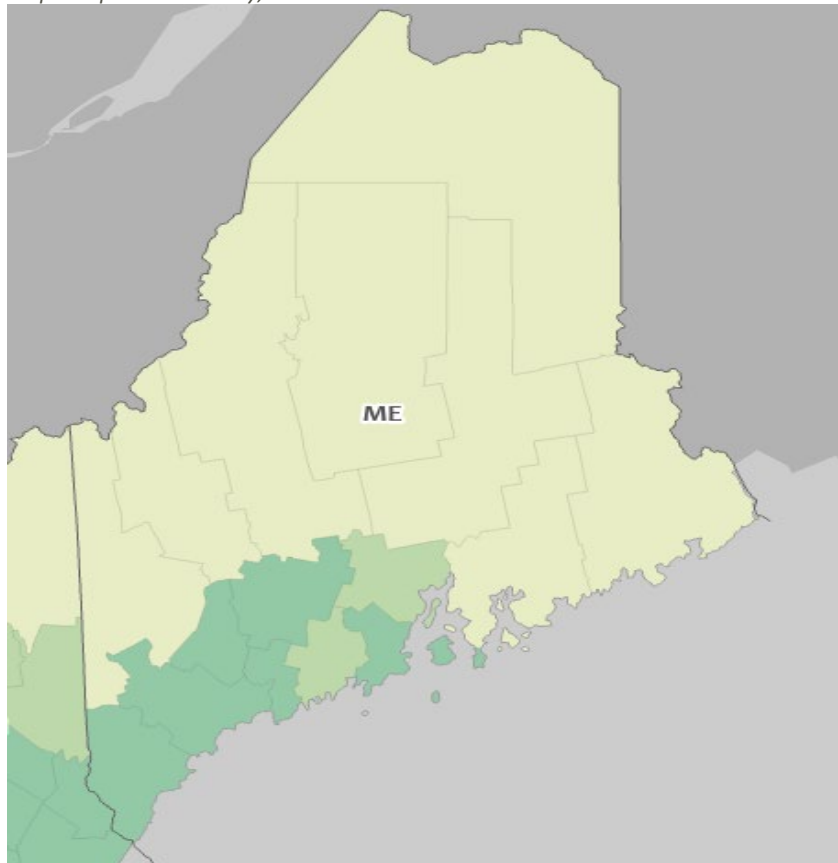
Maine has a land area of 30,836.6 square miles and a water area of 4,553.8 square miles. The land is mountainous in the northwestern portion of the state leveling off as you move east/southeast towards the coast. The water area includes 3,478 coastal shoreline miles and 2,295 miles of inland water area. Maine is bordered by New Hampshire to the west, the Gulf of Maine to the southeast, and the Canadian provinces of New Brunswick and Quebec to the northeast and northwest.

### Demography

#### 1. Population, Age and Gender

Maine's estimated population was 1,362,280 in 2020. The population is most dense in the southeastern coastal counties of York, Cumberland, Sagadahoc, Knox, Lincoln and two inland counties, Androscoggin, and Kennebec.

Map 1 Population Density, 2020 Census



#### Legend

Persons per square mile by county (or county equivalent)



U.S. density = 93.8

The state's total population is projected to increase 0.9% to 2025 and a further 1.7% from 2025 to 2030 for a total 2.6% increase over the entire ten-

year period. Individual county projections for 2020 – 2030, are shown below.<sup>1</sup> Thirteen of Maine’s sixteen counties are projected to see population increases into 2030 with Washington County seeing the greatest increase of 8.0%.

Table 1, Maine Population Outlook, 2020 - 2023 Maine State Economist

Maine County Total Population				Percent Change in Population			
	2020 (historical)	2025	2030		2020-2025	2025-2030	2020-2030
Androscoggin	111,039	111,250	113,477	Androscoggin	0.2%	2.0%	2.2%
Aroostook	66,994	66,602	66,937	Aroostook	-0.6%	0.5%	-0.1%
Cumberland	303,312	304,451	308,124	Cumberland	0.4%	1.2%	1.6%
Franklin	29,418	29,330	29,603	Franklin	-0.3%	0.9%	0.6%
Hancock	55,460	56,140	56,707	Hancock	1.2%	1.0%	2.2%
Kennebec	123,754	126,211	130,259	Kennebec	2.0%	3.2%	5.3%
Knox	40,609	40,944	41,130	Knox	0.8%	0.5%	1.3%
Lincoln	35,192	35,361	35,364	Lincoln	0.5%	0.0%	0.5%
Oxford	57,849	58,121	58,321	Oxford	0.5%	0.3%	0.8%
Penobscot	152,007	152,059	153,327	Penobscot	0.0%	0.8%	0.9%
Piscataquis	16,768	16,424	15,935	Piscataquis	-2.0%	-3.0%	-5.0%
Sagadahoc	36,688	36,794	36,921	Sagadahoc	0.3%	0.3%	0.6%
Somerset	50,404	49,889	49,781	Somerset	-1.0%	-0.2%	-1.2%
Waldo	39,635	40,843	42,405	Waldo	3.0%	3.8%	7.0%
Washington	31,062	32,099	33,555	Washington	3.3%	4.5%	8.0%
York	212,089	218,208	225,816	York	2.9%	3.5%	6.5%

Maine’s older adult population continues to comprise a larger percentage of the state’s total population and is projected to continue doing so.

Table 2, Maine Population Outlook, 2020 - 2023 Maine State Economist

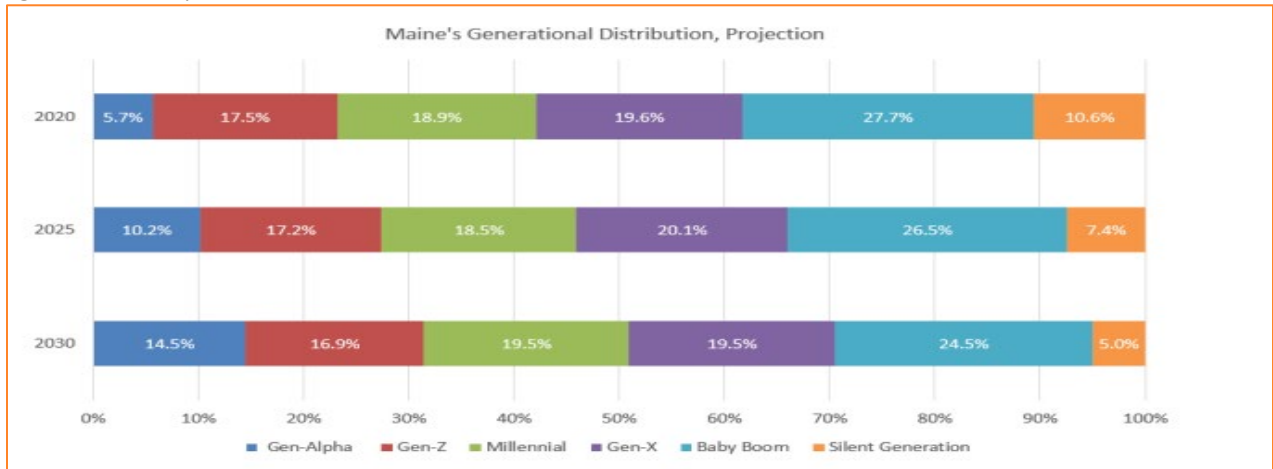
Maine Statewide Population by Age				Percent Change in Population			
	2020 (historical)	2025	2030		2020-2025	2025-2030	2020-2030
Age 0-19 years	286,218	264,935	258,901	Age 0-19 years	-7.4%	-2.3%	-9.5%
Age 20-39 years	320,309	325,242	313,804	Age 20-39 years	1.5%	-3.5%	-2.0%
Age 40-64 years	466,899	444,771	431,560	Age 40-64 years	-4.7%	-3.0%	-7.6%
Age 65+ years	288,854	339,780	393,399	Age 65+ years	17.6%	15.8%	36.2%

Baby Boomers comprise the largest percentage of the population at 28%. They will be ageing out of the workforce and by 2030, baby boomers will decline to 24% of the population.<sup>2</sup> In 2021, most baby boomers were 57 – 75 years-old, but by 2030, they will be 66 to 84.

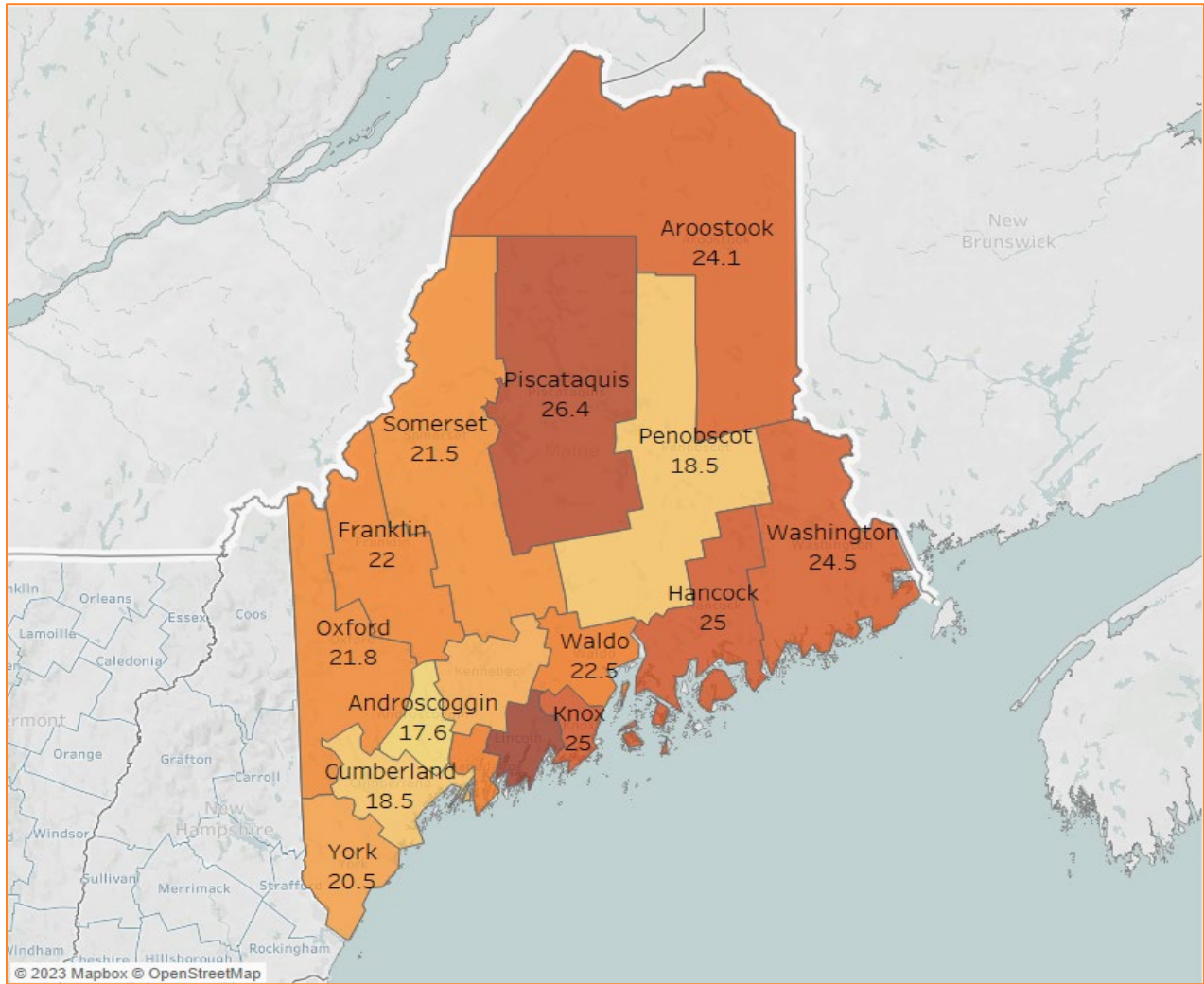
<sup>1</sup> Maine Population Outlook 2020 to 2030, June 2023, Office of the Maine State Economist, p.3

<sup>2</sup> Ibid.

Figure 1, Maine Population Outlook, 2023, Maine State Economist

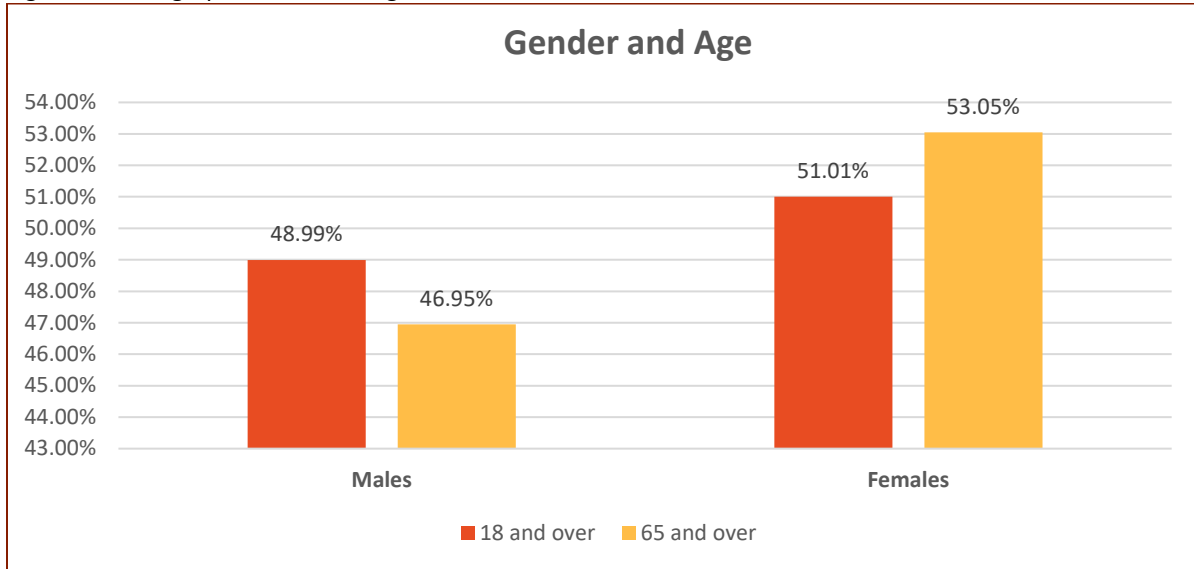


Map 2, Percent of the Population 65 and older (CDC/ATSDR Social Vulnerability Index 2020)



The ratio of males to females is about 2% statewide and in the counties. However, as the population ages, the ratio widens to 6%.<sup>3</sup> This will likely result in additional older adult females living alone and subsequently more at risk than those still with their significant other or house mates.

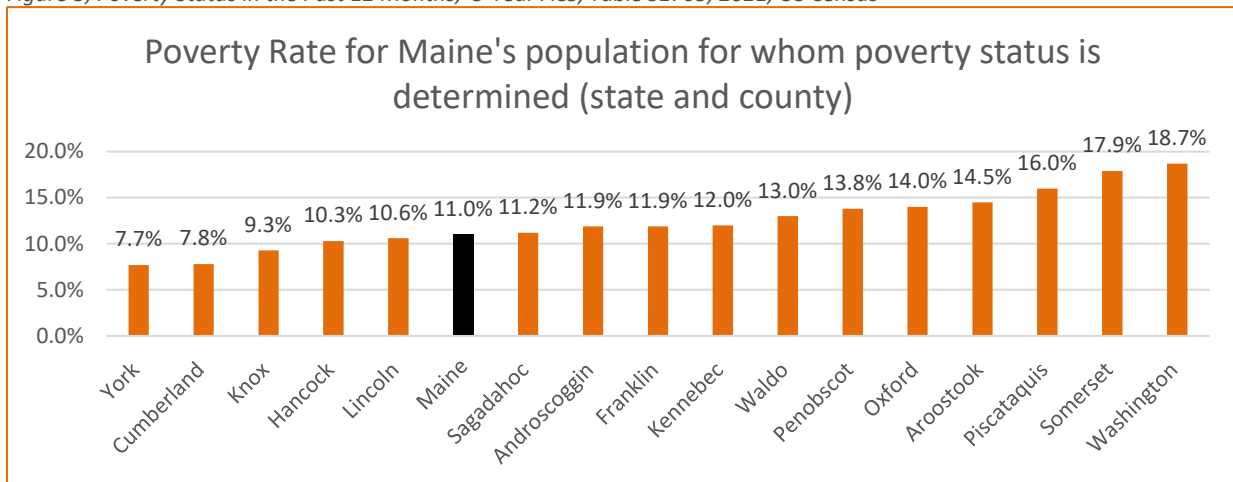
Figure 2, Demographic and Housing Estimates, ACS 5-Year. Table DP05, 2021, US Census



## 2. Income and Poverty

Maine’s poverty rate is 11% or 1.6% below the nation’s 12.6%. As you move out to the state’s more sparsely populated rural areas, that rate increases.<sup>4</sup>

Figure 3, Poverty Status in the Past 12 Months, 5-Year ACS, Table S1703, 2021, US Census

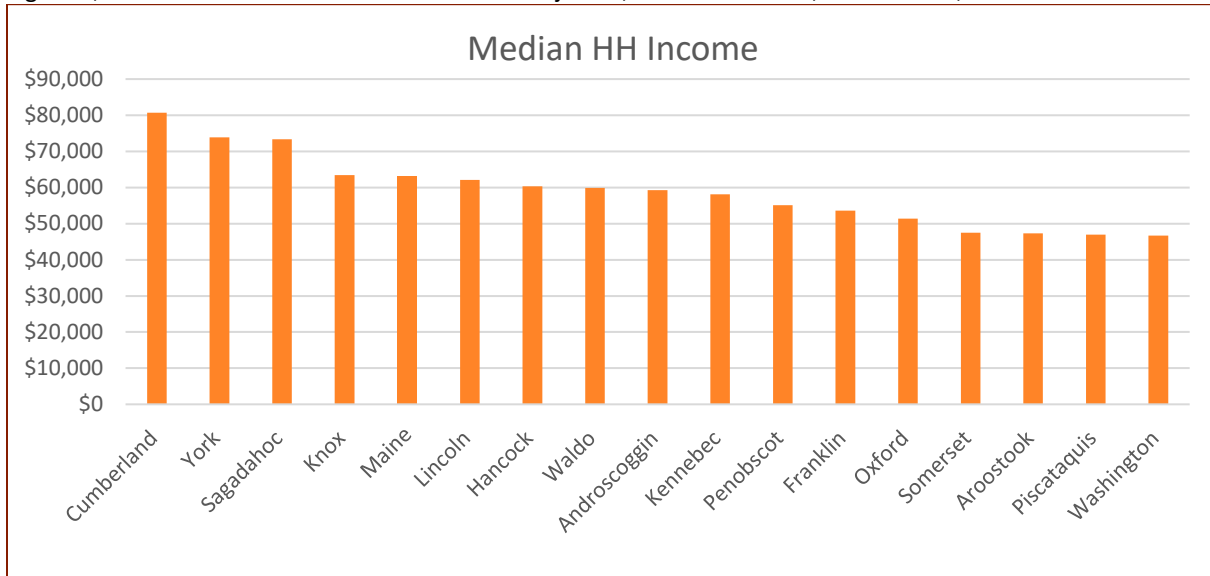


<sup>3</sup> U.S. Census, 5-Year ACS, Table DP05

<sup>4</sup> U.S. Census, 5-Year ACS, Table S1703

Inverse to poverty rates, median household income decreases in the more sparsely populated counties.<sup>5</sup>

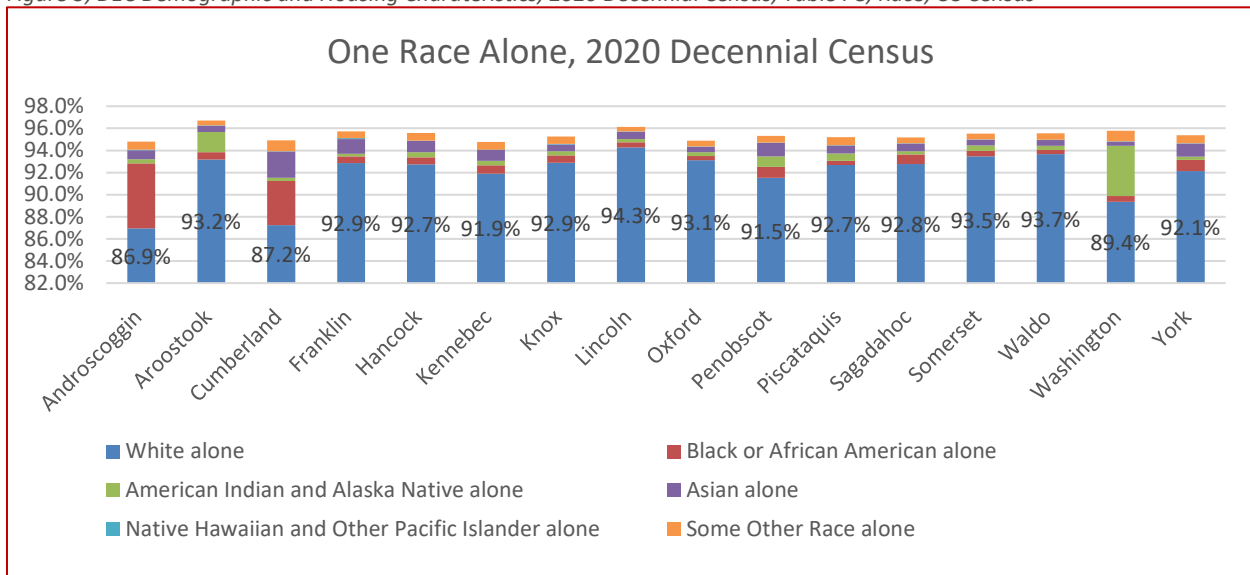
Figure 4, Median Income in the Past 12 Months Adjusted, 2021 ACS 5-Year, Table S1903, US Census



### 3. Race, Education and Challenged Populations

Maine remains a homogenous state though that is slowly changing. The state overall is 92% white with only Androscoggin, Cumberland, and Washington counties less than 90% white.

Figure 5, DEC Demographic and Housing Characteristics, 2020 Decennial Census, Table P8, Race, US Census

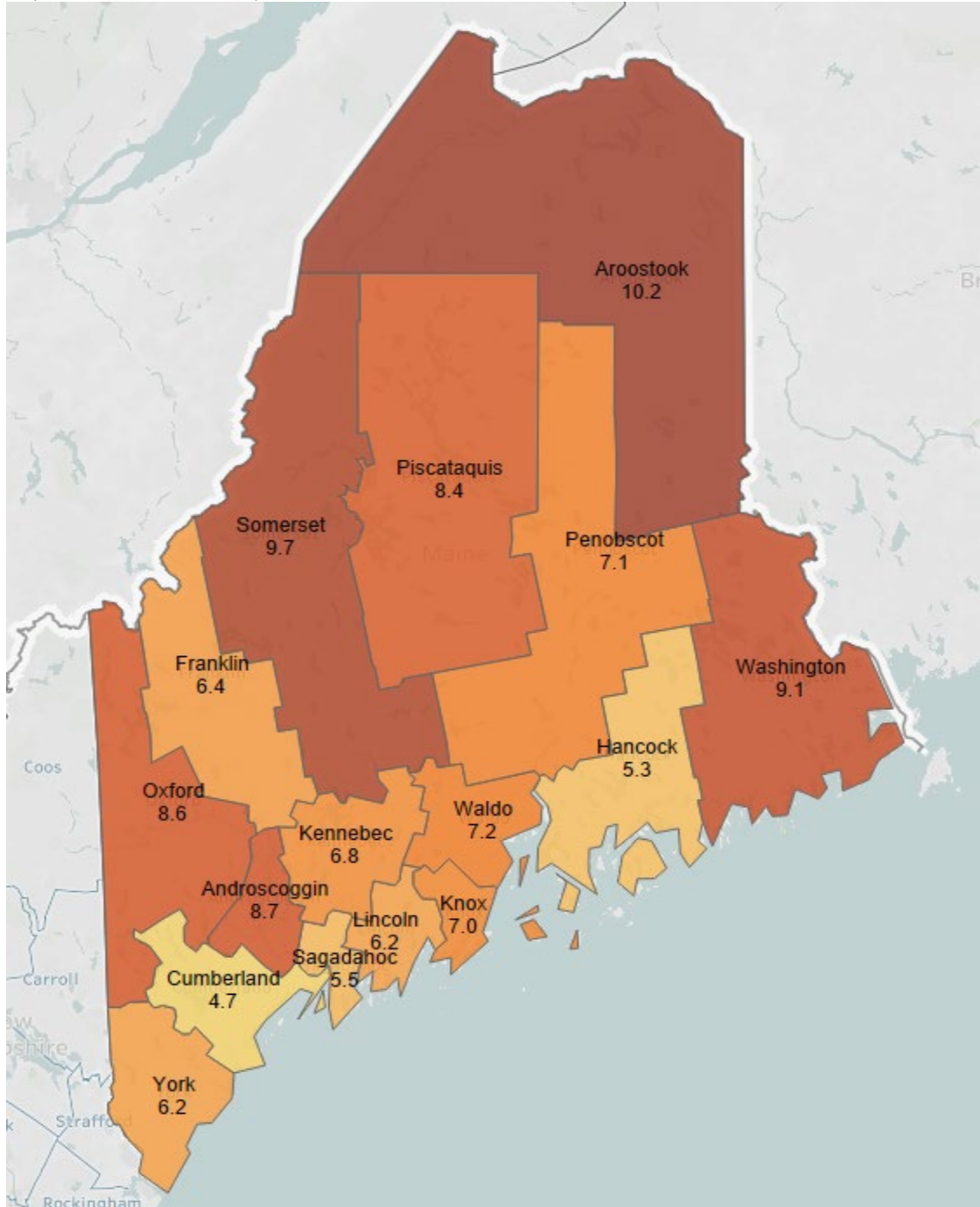


<sup>5</sup> U.S. Census, 2021 5-Year American Community Survey, Table S1903



Ninety-three percent of Maine residents over the age of 25 years old have a high school or greater level of education. This compares to only 88.5% nationwide. The remaining 6.8% of Maine residents have less than a high school education compared to 11.5% nationwide. The distribution by county follows a pattern like poverty, where the more rural sparsely populated counties of the state have lower education levels.

Map 3, Percent without HS Diploma, 2021 ACS 5-Year, Table B6009 US Census



Maine has a 15.8% disabled population compared to the nation's 12.6%. Independent living and cognitive difficulty are the leading disability types. Not surprisingly, for those over 65, ambulatory difficulty is the leading disability.

Map 4, Selected Social Characteristics, Percent with Disability, 2021 ACS 5-Year, Table DP02, US Census

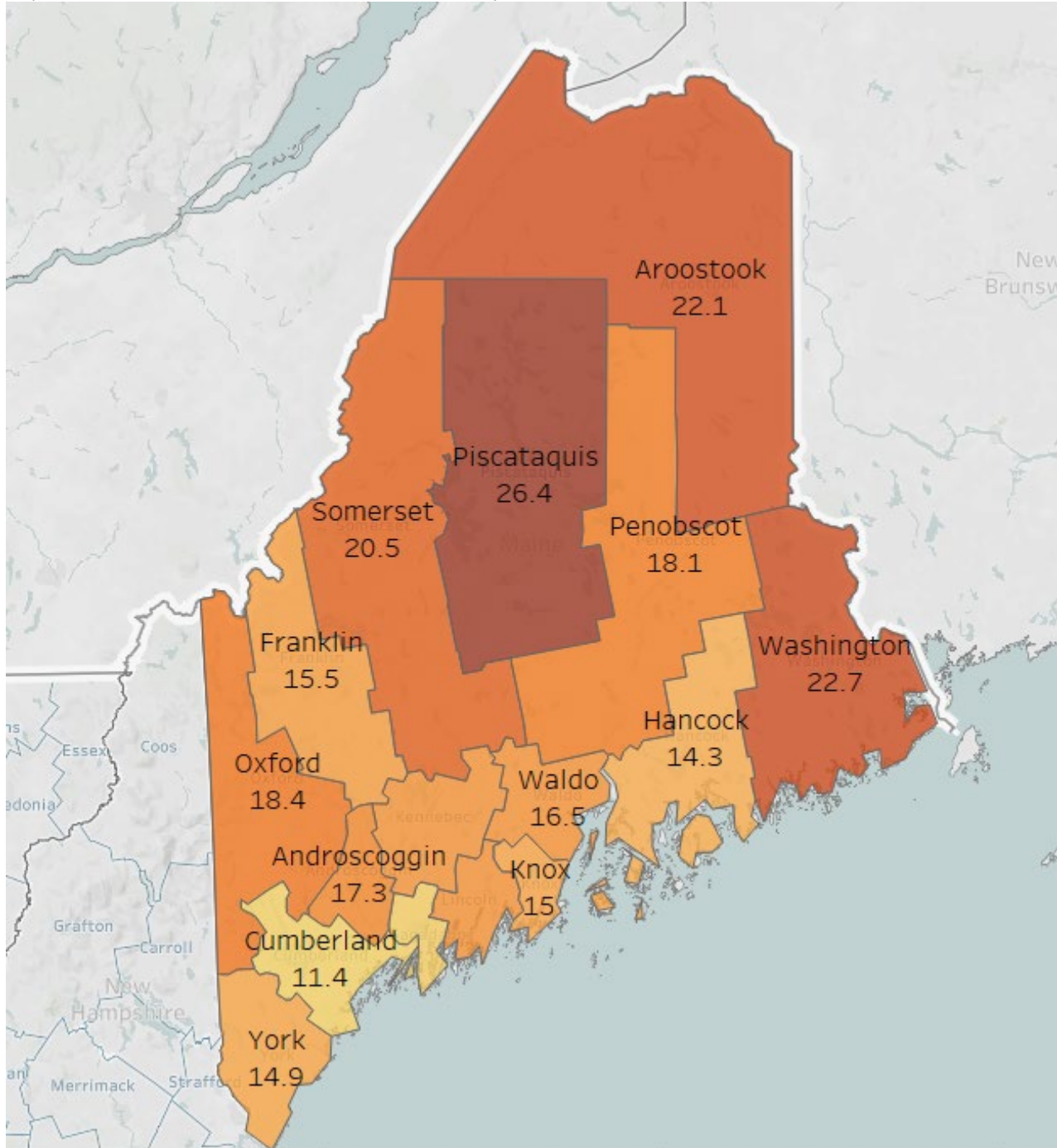




Figure 6, Disability, 2021 ACS 5-Year Table S1810, US Census

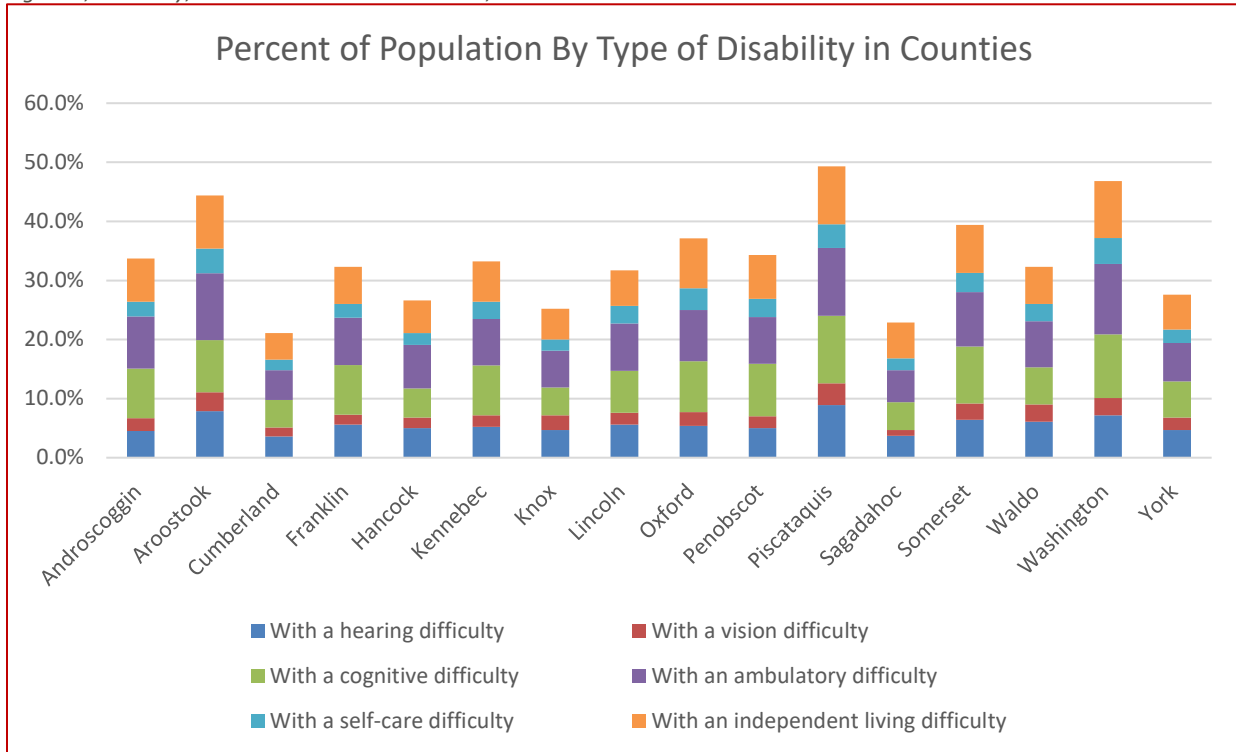
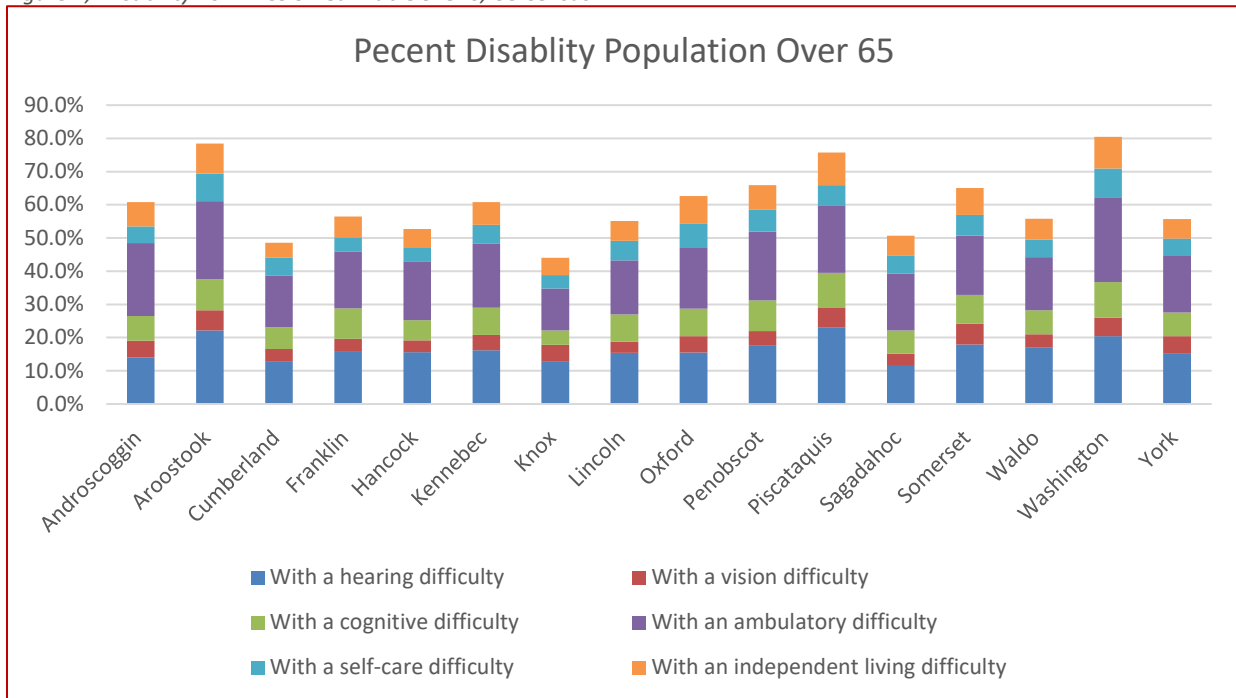


Figure 7, Disability 2021 ACS 5-Year Table S1810, US Census

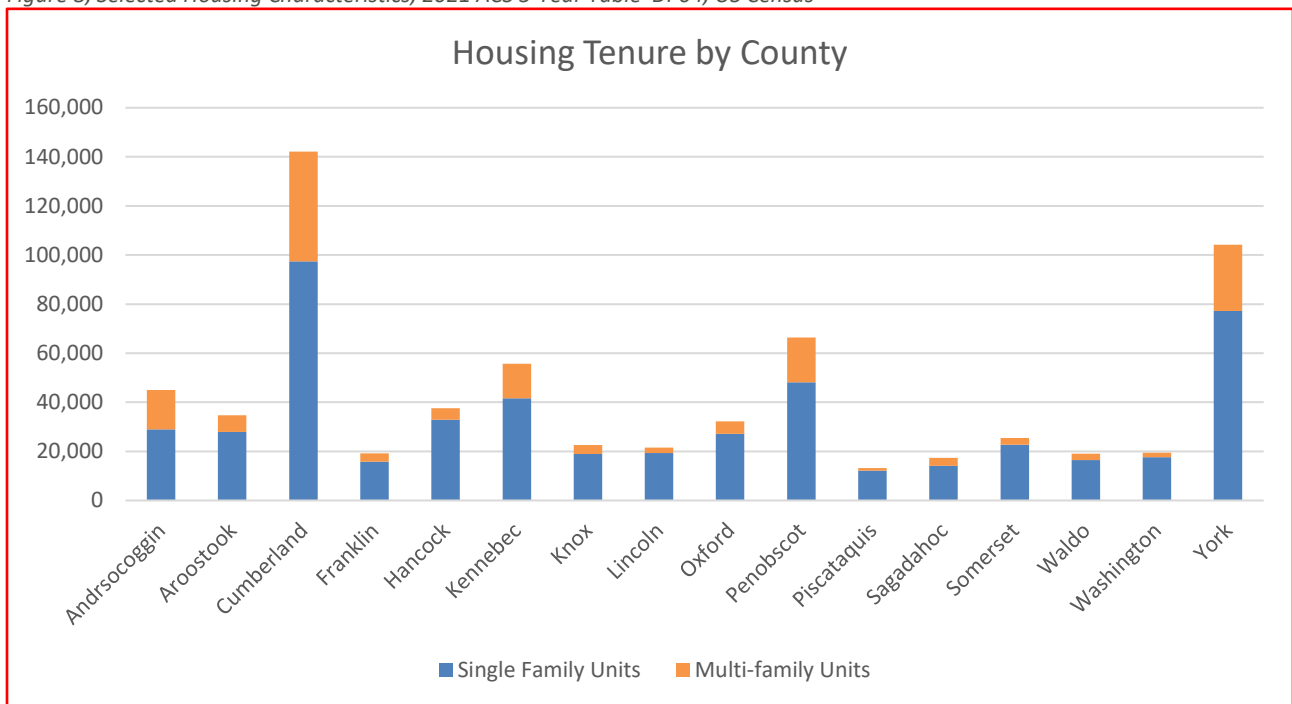


#### 4. Housing

Housing has a considerable impact on health and safety in several ways. Older homes pose potentially higher risks of lead or structural faults. The closeness of housing units can contribute to more rapid fire spread or exposure. The proximity of homes to emergency services can make the difference between life and death or the severity of an injury. Crowding in homes can also contribute to falls, the spread of colds, and to more severe outcomes in the event of a fire.

Total housing units, owned and rented, are fewer in the more rural less populated areas of the state (figure 8), but older (figure 9). Many are far away from services including health care and emergency services.

Figure 8, Selected Housing Characteristics, 2021 ACS 5-Year Table DP04, US Census

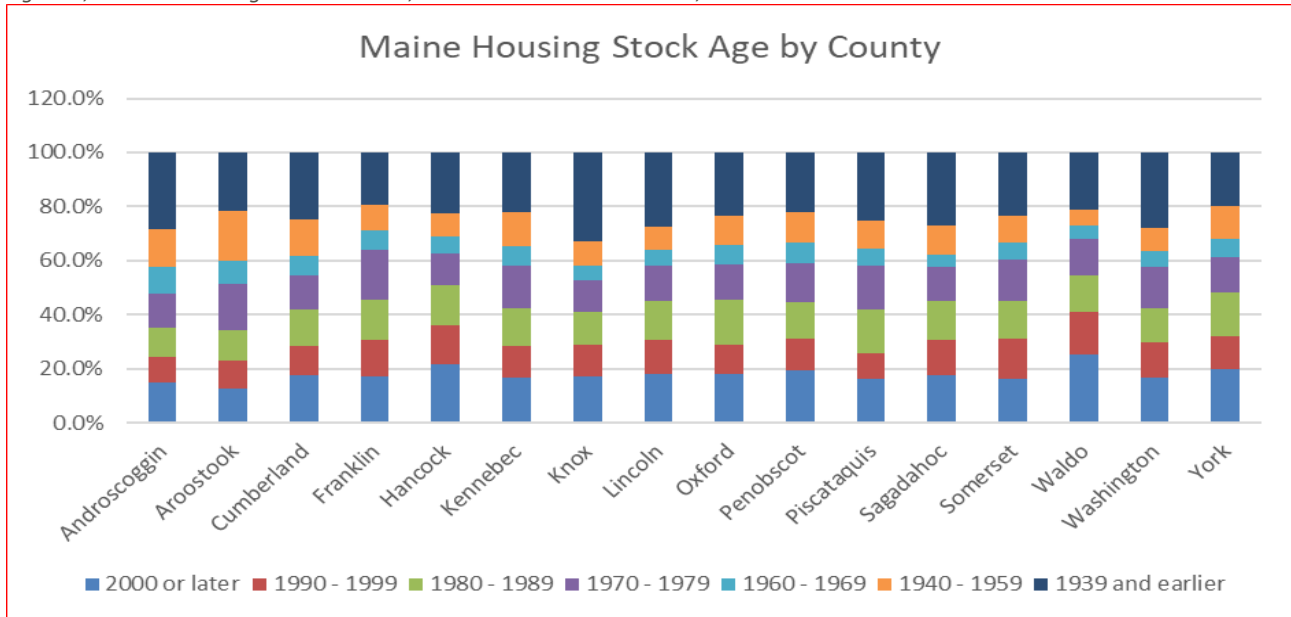


The age of housing can have considerable impact on safety. Unlike newly built homes, homes built prior to 1976 were not required to have smoke alarms built in.<sup>6</sup> Generally speaking, older homes are less safe. Older homes tend to leave people, especially older adults, more susceptible to falls and/or injury. Wiring in older homes can also pose fire risks.

In figure 9 on the next page, you can see the distribution of housing stock by age in each of Maine’s counties. As expected, there are more new homes, 1980 – 2000 or later in Maine’s more populated counties, and fewer in the more sparsely populated areas.

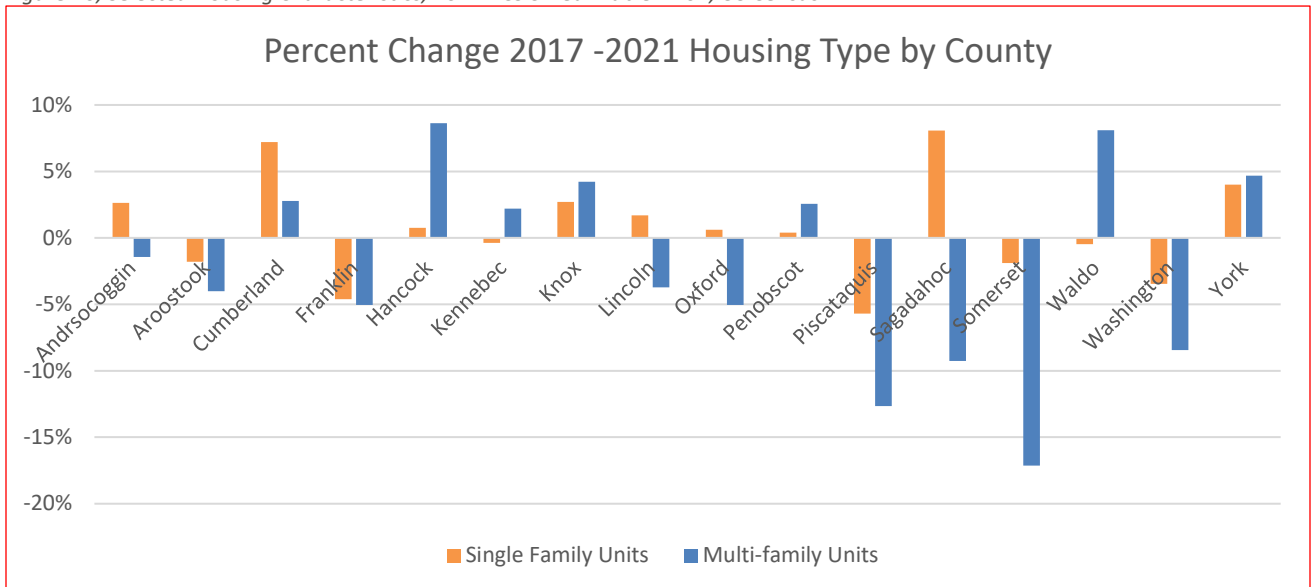
<sup>6</sup> National Fire Protection Association, Life Safety Code 101, 1976 edition.

Figure 9, Selected Housing Characteristics, 2021 ACS 5-Year Table DP04, US Census



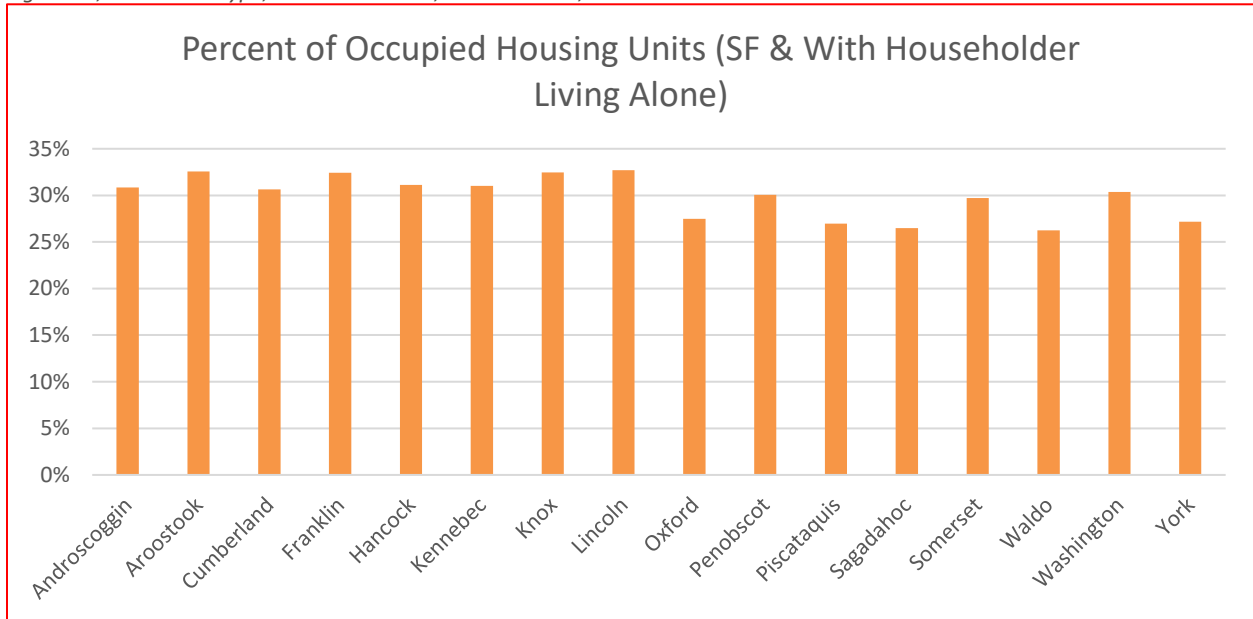
In addition to there being fewer but older housing units in the more rural counties, these counties have also seen declining counts in both rental and owned units (see fig. 10).

Figure 10, Selected Housing Characteristics, 2021 ACS 5-Year Table DP04, US Census



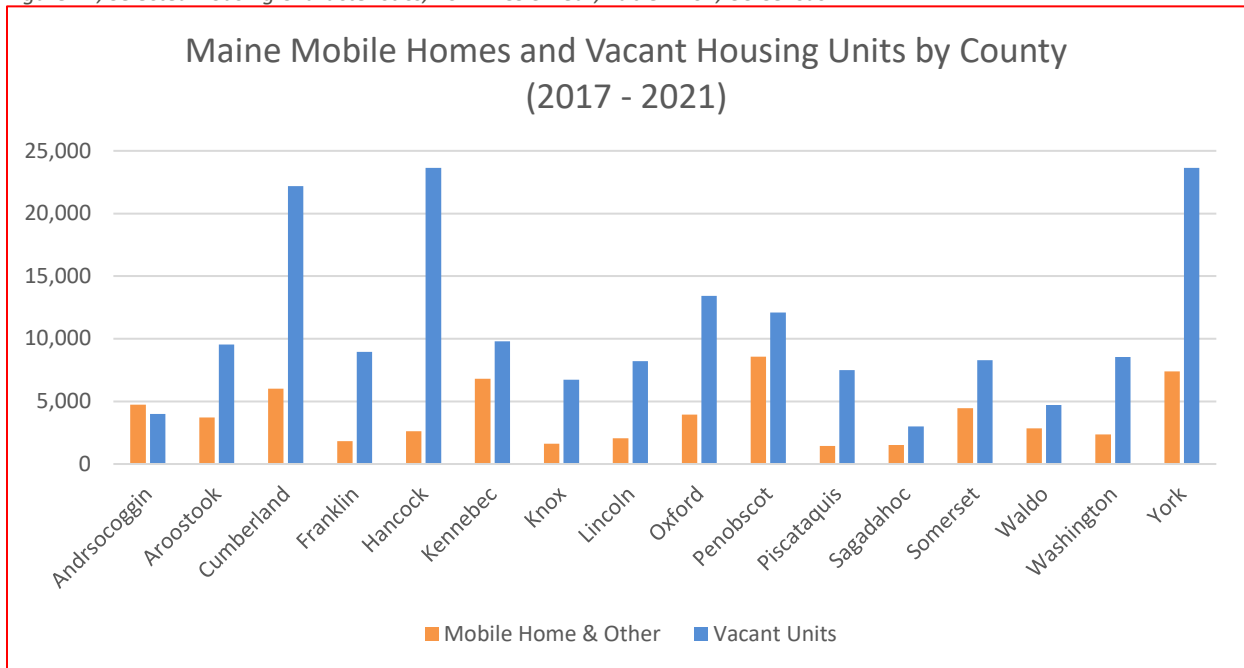
Living alone has greater risk, particularly for older adults, than living in a more traditional household. It can have both negative effects on both physical and mental health. Boredom, loneliness and depression are but a few of these dangers. Those over 65 comprise on average 48%, nearly half, of homes with someone living alone.

Figure 11, Household Type, 2021 ACS 5-Year, Table B11001, US Census



Vacant housing units can create a unique hazard in any community. Often children or those without a home find their way into these units and, because of there being no heat, attempt to heat areas and fire results. Older mobile homes, those build prior to 1976, are particularly susceptible to fires due to outdated wiring. In fact, mobile homes built prior to 1976 were twice as likely to experience a fire.

Figure 12, Selected Housing Characteristics, 2021 ACS 5-Year, Table DP04, US Census



## 5. Infrastructure and Target Hazards

The varying types and counts of infrastructure in any given community is difficult to show, with any clarity, on a map. At the local level GIS technology can portray that local infrastructure clear enough to identify targets. Table 3 below is data drawn from the Geospatial Management Office of the Homeland Infrastructure Foundation-Level Data (HIFLD). The counts represent totals of various types of targets statewide by county and not the attributes of those facilities. For example, some of the facilities are private while others are public. Some serve thousands of planes and passengers while others just few.

Various types of infrastructure carry with them unique hazards and subsequently risks. For instance, aviation facilities provide fueling services and subsequently flammable and hazardous materials. Infrastructures that are public venues, by virtue of the number of people, pose potential risk. In addition, facilities such as nursing home, grammar school or hospital have a particularly vulnerable population.

Table 3, Geospatial Mgt., DHS Infrastructure Foundation-Level Data (HIFLD)

Targets	ANDROSCOGGIN	AROOSTOOK	CUMBERLAND	FRANKLIN	HANCOCK	KENNEBEC	KNOX	LINCOLN	OXFORD	PENOBSCOT	PISCATAQUIS	SAGadahOC	SOMERSET	WALDO	WASHINGTON	YORK
Aviation Facilities	12	22	31	7	11	11	9	10	18	20	18	3	15	6	13	21
Cellular Towers	28	46	26	16	30	42	16	14	32	60	10	16	20	16	26	24
Colleges and Universities	3	3	10	1	2	4	2	0	0	5	0	0	1	1	2	4
Convention Centers	0	0	2	0	0	1	0	0	0	1	0	0	0	0	0	0
Court Houses	2	5	3	2	1	2	1	2	3	3	2	2	2	2	2	4
DOE Petroleum Reserves	0	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0
EPA Response Toxic Substances 2008 -2014	10	0	8	4	2	0	4	0	4	8	0	0	6	3	2	3
Fire Stations	11	28	27	14	27	26	16	13	25	42	8	9	18	21	24	29
General Mfg. Facilities	85	46	190	19	38	47	26	18	32	84	13	17	36	17	21	99
Hospitals	2	4	9	1	4	7	1	2	2	6	2	0	2	1	2	4
Intermodal_Passenger_Connectivity_Database	1	8	17	0	11	3	8	3	0	8	0	1	0	5	1	3
Local Emergency Ops Center	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1
Local Law Enforcement	8	15	25	7	10	10	5	6	9	16	4	5	6	5	8	17
Nursing Homes	136	41	284	24	35	84	33	28	33	170	12	22	40	13	24	131
Power Plants	18	10	11	9	10	11	2	14	29	2	1	18	3	6	10	
Principal Ports	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
Public Schools	41	48	103	17	38	59	21	18	32	71	10	18	34	30	36	67
Waste Water Treatment Plants	148	204	60	12	12	78	32	8	32	82	4	4	56	8	4	104

## Incident Data

### 1. Fire

Below (Figure 13) is a chart of fires by incident type in Maine for the five-year period, 2018 – 2022. As you can see, structures fires are the most frequent type of fire incident (48%) followed by natural vegetation (21%) and mobile property vehicle fires (14%).

In Figure 14 below, you can see the distribution of fires by incident type by county in Maine. Fires in Maine cost an estimated \$43.9 million in total property and contents loss from 2018 – 2022. In addition, fires in Maine resulted in an estimated forty-nine civilian injuries, and in 2023, twenty-nine civilian deaths.

Figure 13, Fires by Incident Type, Maine 2018 – 2022, NFIRS

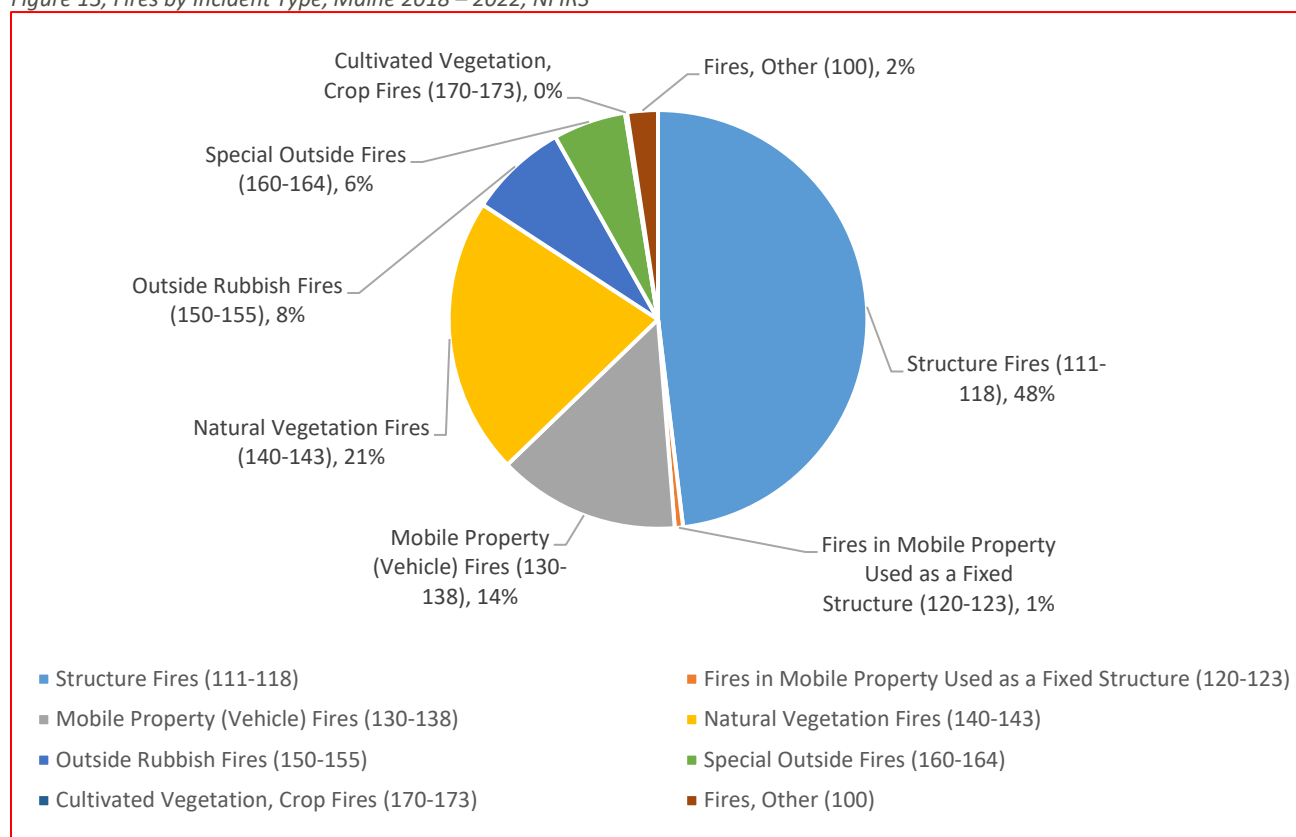
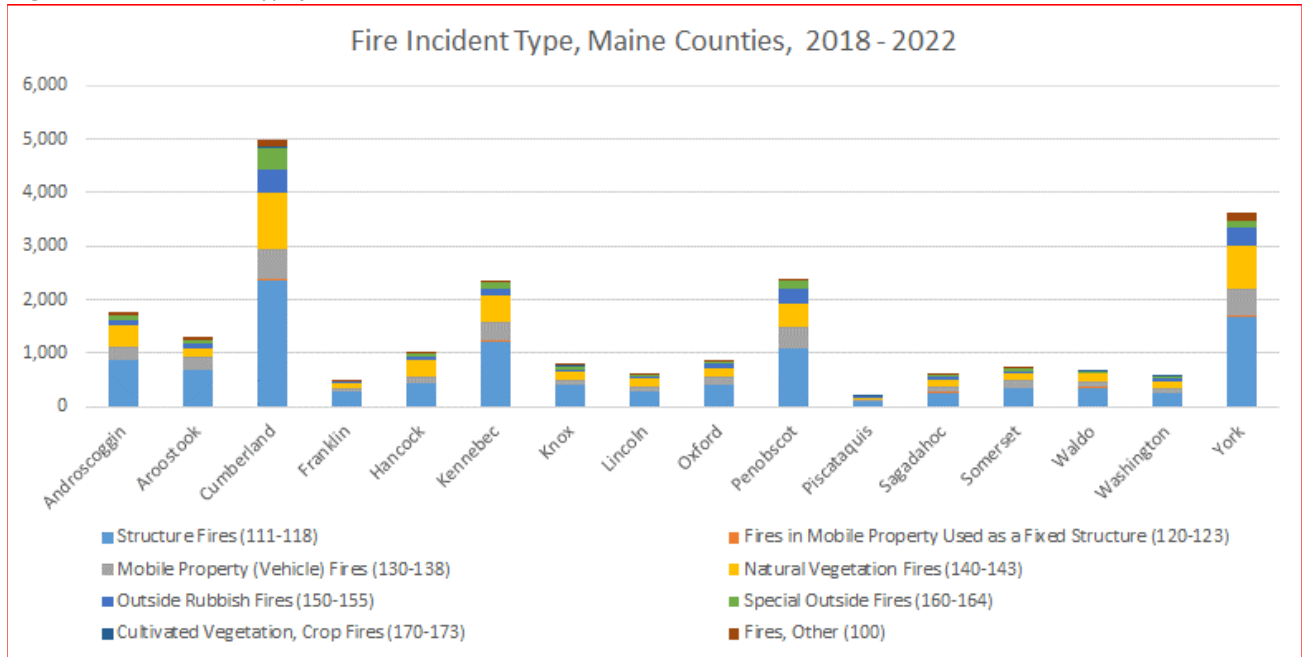


Figure 14, Fires Incident Type for Maine Counties, 2018 – 2022, NFIRS



## 2. Home Structure Fires

Most injuries and fire fatalities will occur in a home. In 2022, an estimated 79% of structure fires took place in a residential structure. Ninety-one percent of those were in single and multiple family dwellings. Eighty-five percent of civilian fire fatalities in Maine will take place in someone's home.<sup>7</sup> Residential structure fires account for 77% of firefighter injuries as well. Why is this happening?

We spend most of our time at home. We sleep and eat there more often than anywhere else and we must maintain an environment suitable for inhabiting that home year-round. As such, it's not surprising that heating and cooking are the most frequent cause of fires along with electrical problems. The condition of our home, its systems, and what we put in it are its physical attributes and what we, humans, do in it is the home's behavioral attributes. Malfunctioning or improperly installed equipment, non-code stairways, windows mitigation systems such as smoke alarms among other elements of the home's physical attributes contribute to fires starting and the severity of those fires. What we do in terms of upkeeping our heating devices, chimneys, keeping egress ways free of clutter, smoking and improper use of drugs and alcohol are but a few of many human behavioral issues contributing to fire frequency and severity.

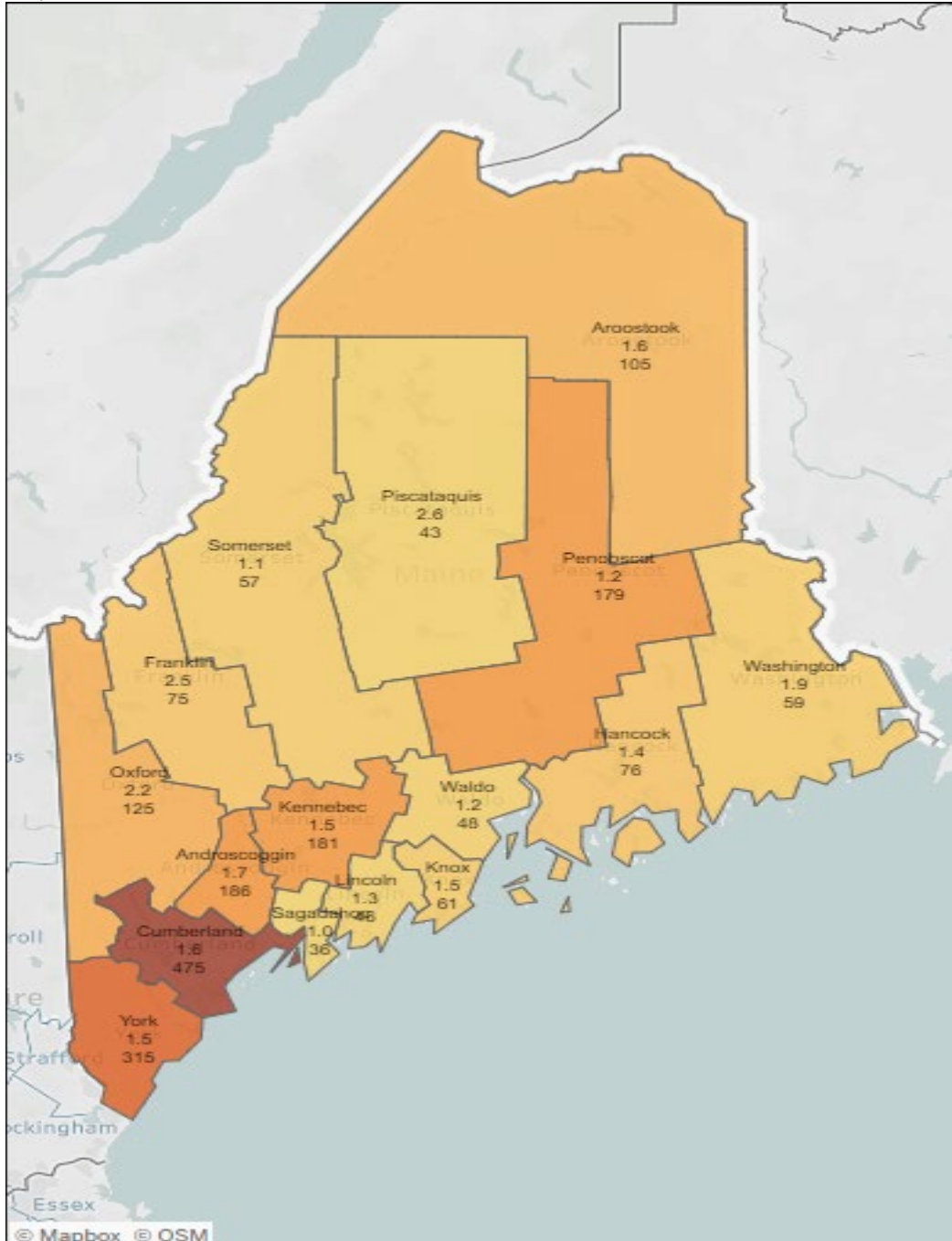
Map number 5 on the following page provides counts and rates of home fires in 2022. Most of these events take place in our most populated counties such as York, Cumberland, Kennebec,

<sup>7</sup> 2022 Office of the State Fire Marshal's Annual Report (NFIRS Data)

Androscoggin and Penobscot. However, the rate of home fires per 1,000 people (see map 6), is greater in rural counties. Piscataquis County has the highest rate at 2.6 followed by Franklin County at 2.5, Oxford County at 2.2, and Washington County at 1.9. Most of these fires are accidental in character.

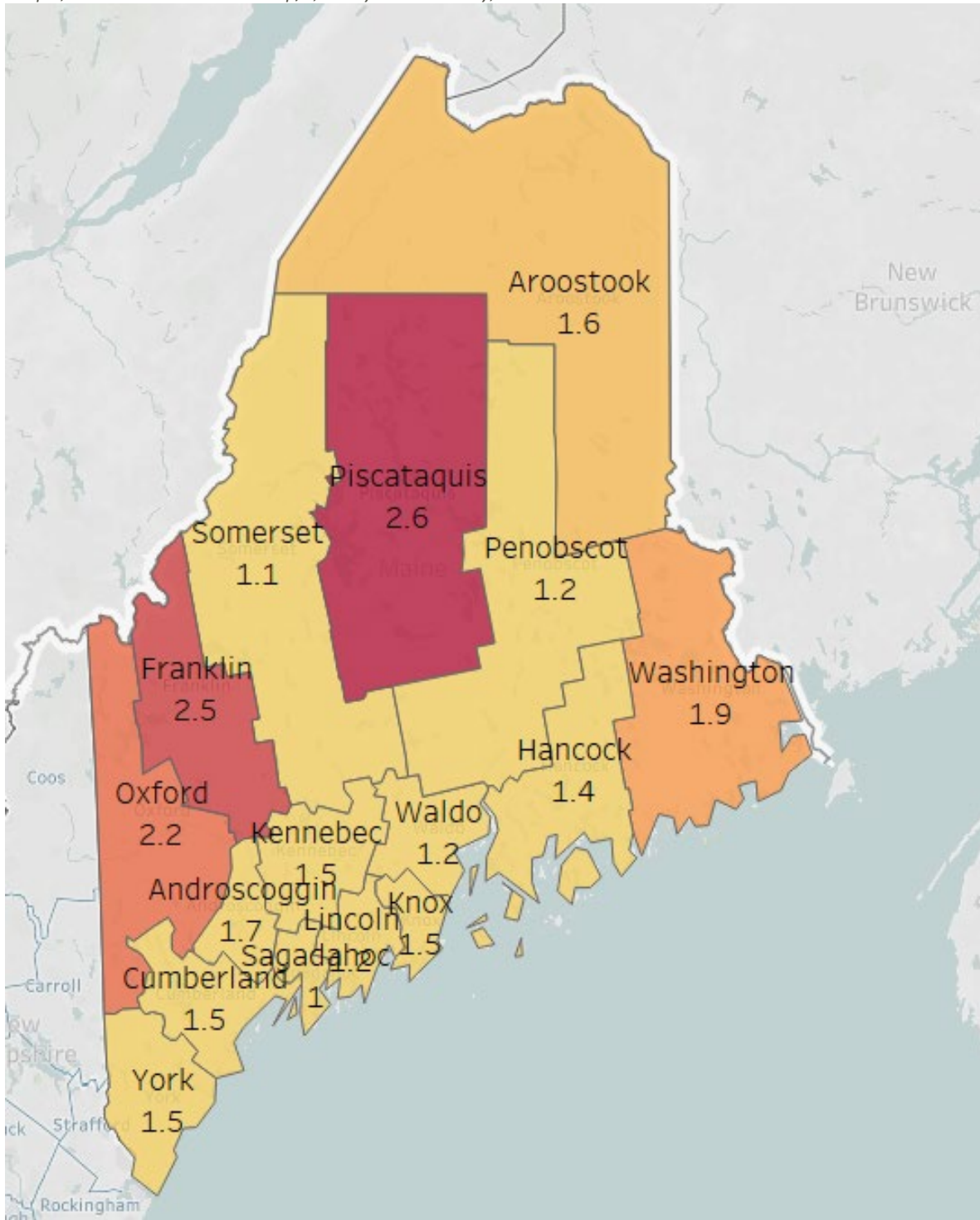
Most home fires resulting in a fatality (see map 6), will occur in the more populated counties, but again, the rate p/1,000 is higher in the rural areas such as Washington County at 2.3, Franklin County at 2.4, Oxford County at 1.9, and Hancock County at 1.8.

Map 5, Home Structure Fires in Maine Homes, 2022





Map 6, Home Structure Fires Rate p/1,000 by Maine County, 2022



## Maine County Fatality Count and Rate p/10,000

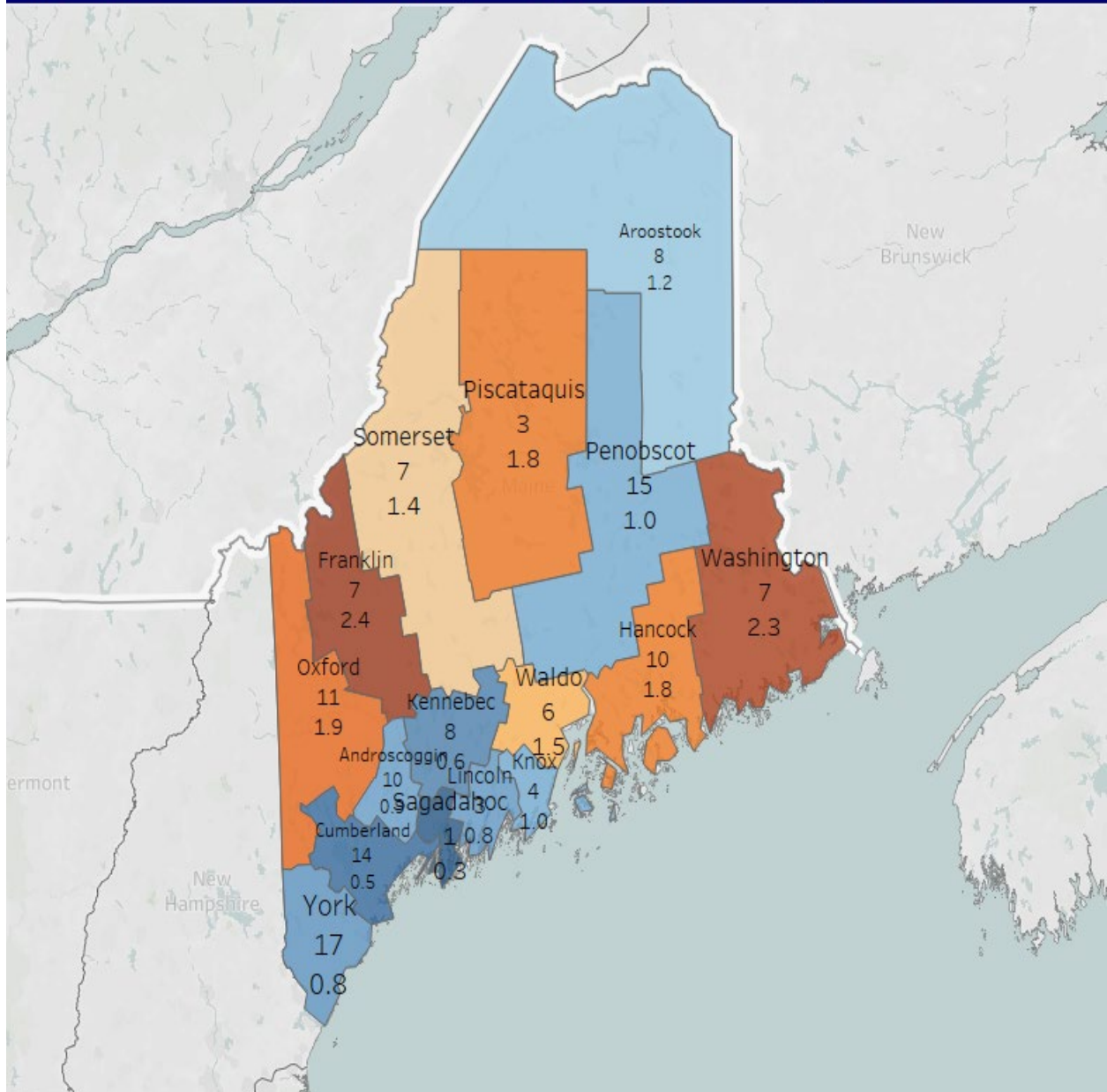


Table 4, Home Fires by Cause 2018 – 2022, NFIRS

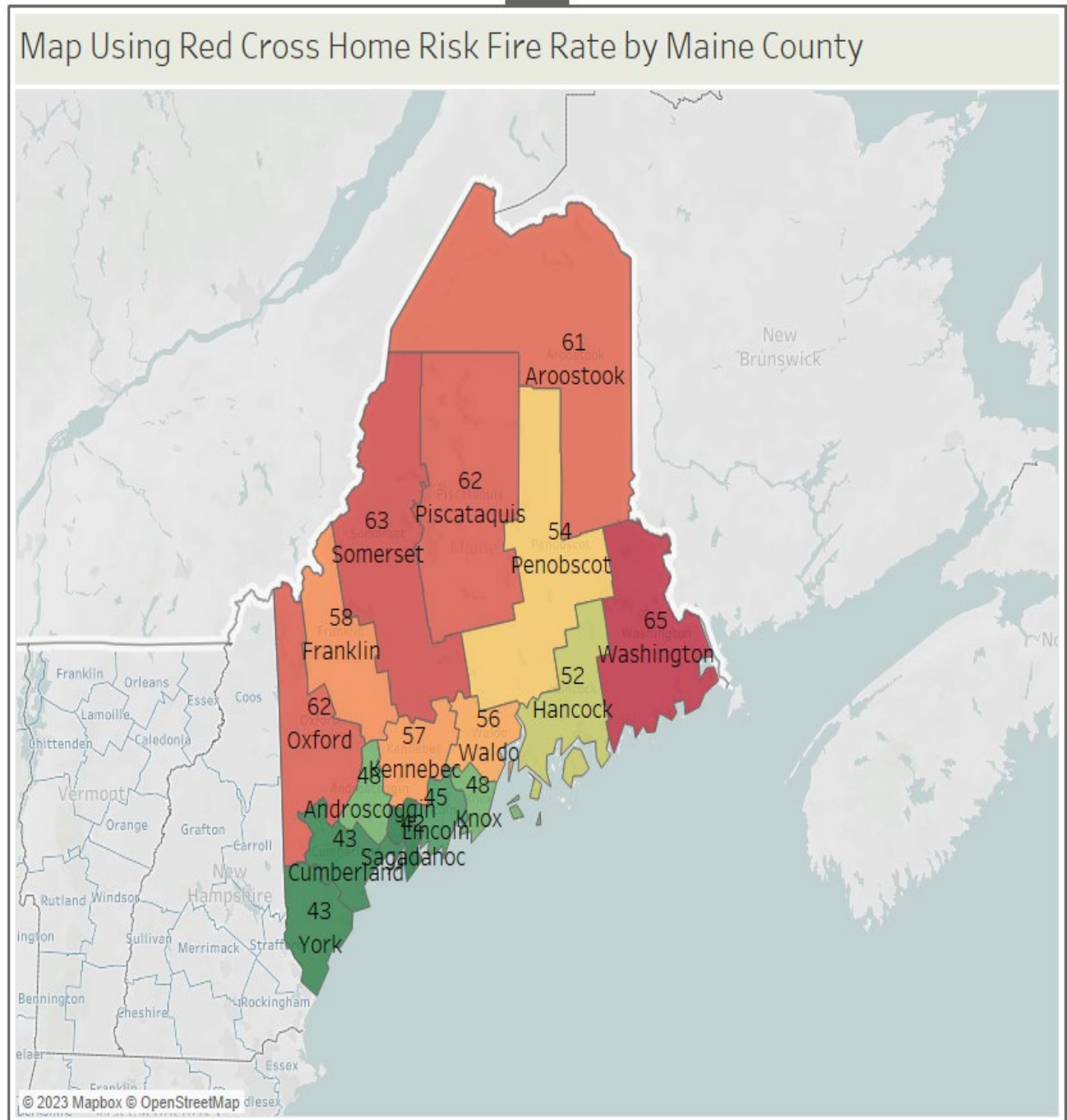
Cause	Androscoggin County	Aroostook	Cumberland	Franklin	Hancock	Kennebec	Knox	Lincoln	Oxford	Penobscot	Sagadahoc	Somerset	Waldo	Washington	York
01 -- Intentional	24	14	50	3	5	9	2	3	2	11	5	9	8	6	14
02 -- Playing with Heat Source	4	1	1	1	1	4	0	0	0	0	1	0	1	1	0
03 -- Smoking	35	13	27	7	5	25	11	2	6	32	3	4	7	3	12
04 -- Heating	151	134	368	107	127	266	138	93	135	260	57	67	97	109	154
05 -- Cooking	214	69	818	27	69	309	45	35	49	185	24	30	22	27	65
06 -- Electrical Malfunction	31	30	78	15	14	45	14	12	9	65	5	15	21	16	18
07 -- Appliances	23	8	53	0	5	8	6	3	5	7	0	5	3	1	7
08 -- Open Flame	31	31	71	11	10	28	12	8	16	30	5	11	16	9	8
09 -- Other heat	13	3	31	1	5	11	1	1	3	14	0	7	7	5	11
10 -- Other Equipment	0	2	6	0	0	4	1	2	0	4	1	0	1	1	1
11 -- Natural	8	10	23	3	3	8	3	3	7	8	2	8	3	1	2
12 -- Exposure	8	23	21	4	4	26	4	4	3	21	2	4	8	6	10
13 -- Unknown	61	62	96	13	40	61	15	8	23	82	16	21	28	21	33
14 -- Equipment Misoperation, Failure	17	21	29	4	6	36	13	10	14	34	6	8	11	8	9
15 -- Other Unintentional, Careless	35	36	52	12	19	54	11	18	29	49	8	21	27	21	19
16 -- Investigation with Arson Mod.	9	2	10	0	5	2	7	0	3	0	0	4	1	1	2

The Red Cross Home Fire Risk map on the next page is based on the estimate of homes without a smoke alarm, the prevalence of home fires over a five-year period and the likelihood that a home fire could result in a death or injury. In addition, socio economic data from the CDC’s Social Vulnerability Index is also incorporated in the risk rating calculation.<sup>8</sup>

Again, the Red Cross Home Fire Risk Map (map 8) shows an increased risk as you move from the more populated southeastern portion of the state out in a north by northwesterly direction. Washington and Somerset counties have the highest risk of home fires.

<sup>8</sup> For more detail on the Red Cross Fire Risk Model go to: [Home Fire Risk Map \(redcross.org\)](https://www.redcross.org/home-fire-risk-map) You can also view the CDC Social Vulnerability index at: [CDC/ATSDR Social Vulnerability Index \(SVI\)](https://www.cdc.gov/atdsr/social-vulnerability-index/)

Map 8, Red Cross Home Fire Risk Rate for Maine Counties



### 3. All Incidents

Fire Departments in Maine respond to a variety of incident types requiring varying levels of skill. Those skills are reliant upon available training opportunities. Nearly 70% of incidents will be EMS/Rescue related. (see figure 15). This makes sense considering the so many workers need a vehicle to get to work.



Figure 15, Incidents by Type, 2018 - 2022, NFIRS

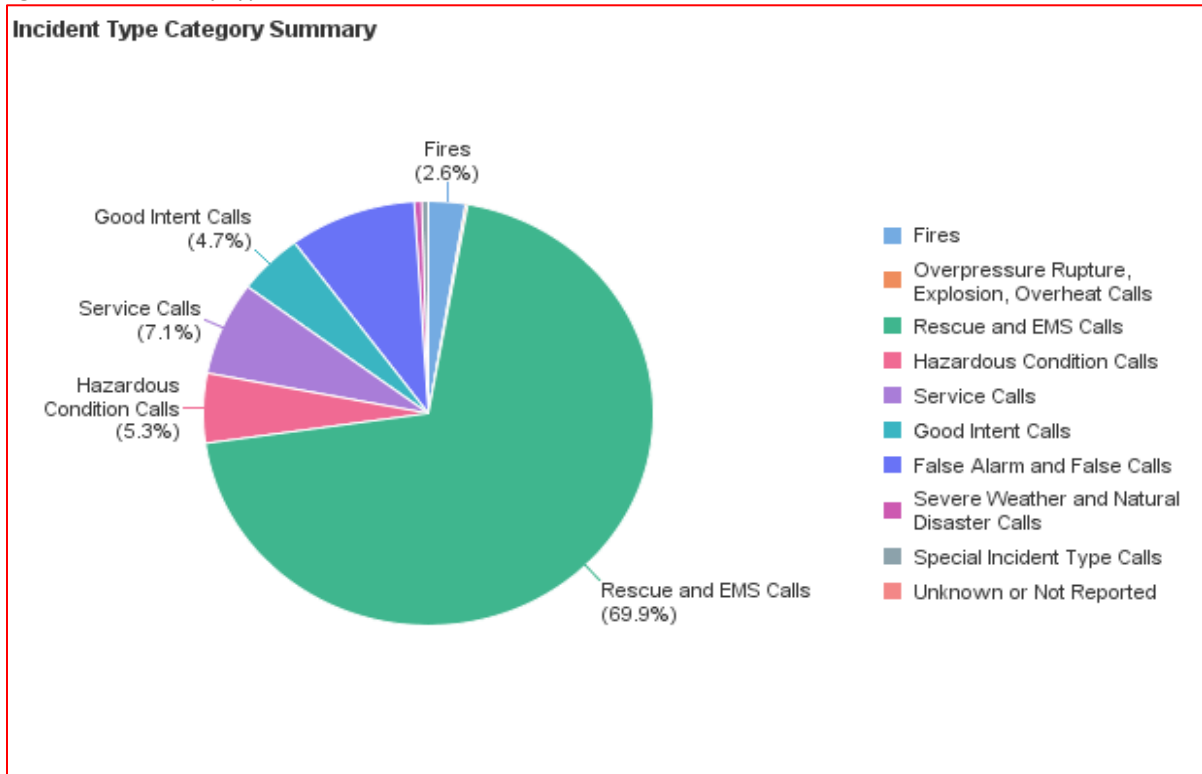


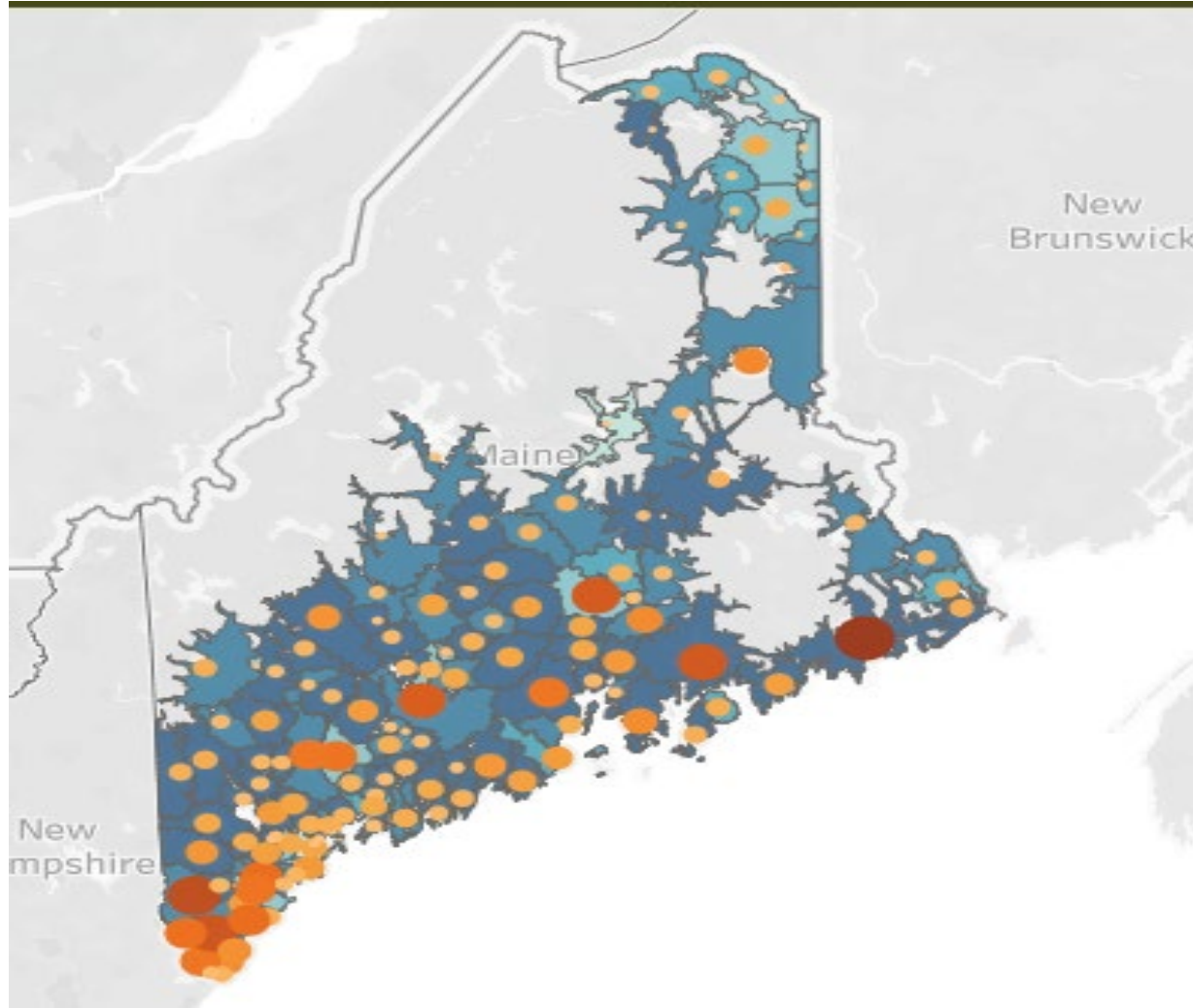
Table 5, Percent Incident Type by County, 2018 – 2022, NFIRS

	Androscoggin	Aroostook	Cumberland	Franklin	Hancock	Kennebec	Knox	Lincoln	Oxford	Penobscot	Piscataquis	Sagadahoc	Somerset	Waldo	Washington	York
<b>Fires (100-173)</b>	3.8%	8.6%	2.1%	8.3%	4.3%	3.9%	4.5%	7.8%	6.4%	2.8%	8.0%	3.0%	5.0%	12.9%	10.0%	2.6%
<b>Overpressure Rupture, Explosion, Overheat Calls (200-251)</b>	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	0.3%	0.4%	0.1%	0.2%	0.3%	0.1%
<b>Rescue and EMS Calls (300-381)</b>	65.8%	68.7%	72.9%	30.8%	54.0%	70.1%	63.2%	52.0%	41.5%	73.4%	39.0%	73.1%	63.0%	28.9%	59.9%	70.1%
<b>Hazardous Condition Calls (400-482)</b>	8.2%	4.5%	4.6%	28.2%	8.4%	5.7%	5.7%	18.9%	21.4%	3.9%	13.8%	6.1%	9.1%	24.2%	4.9%	5.6%
<b>Service Calls (500-571)</b>	6.2%	4.8%	5.5%	11.8%	9.6%	6.2%	9.7%	4.1%	10.9%	5.6%	24.6%	4.2%	11.4%	5.9%	9.7%	7.1%
<b>Good Intent Calls (600-672)</b>	6.0%	3.6%	4.6%	7.5%	6.7%	6.4%	3.3%	5.4%	7.3%	7.9%	6.8%	4.9%	4.4%	9.3%	7.0%	4.7%
<b>False Alarm and False Calls (700-751)</b>	9.1%	6.7%	9.5%	9.6%	15.1%	6.6%	11.5%	10.6%	9.5%	5.9%	6.5%	7.5%	4.6%	14.1%	6.6%	9.0%
<b>Severe Weather and Natural Disaster Calls (800-815)</b>	0.2%	0.3%	0.2%	3.0%	0.8%	0.2%	0.6%	0.7%	1.4%	0.2%	0.0%	0.4%	1.9%	2.0%	0.3%	0.6%
<b>Special Incident Type Calls (900-911)</b>	0.4%	2.6%	0.2%	0.5%	1.0%	0.7%	1.3%	0.4%	1.2%	0.3%	0.9%	0.4%	0.5%	2.4%	1.2%	0.3%
<b>Unknown or Not Reported</b>	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.2%	0.0%

#### 4. Wildland Fire

Maine is the most forested state in the United States averaging 650 wildfires per year. Wildfires destroy 550 acres annually. An estimated 79% of homes in Maine are located within a Wildland Urban Interface (WUI). The WUI is where the home meets the forest, and this presents challenges for both structural and wildland firefighters. Firefighting in these areas is limited by poor road access, and in most cases, difficult access to water for fire suppression. Due to the buildup of fine forest fuels (needles and leaves), the risk of home igniting from embers from a wildfire or nearby structure fire in Maine is high. As we continue to see warmer than average temperatures and windstorms that bring down trees creating a large debris layer in our forests; the risk of wildland fires in these WUI areas will only increase. In map 9 below you can see areas of high wildfire risk in Maine. Small communities don't have financial resources for large fuel reduction projects. Coastal islands and peninsulas rarely have markets where trees can be harvested and sold.

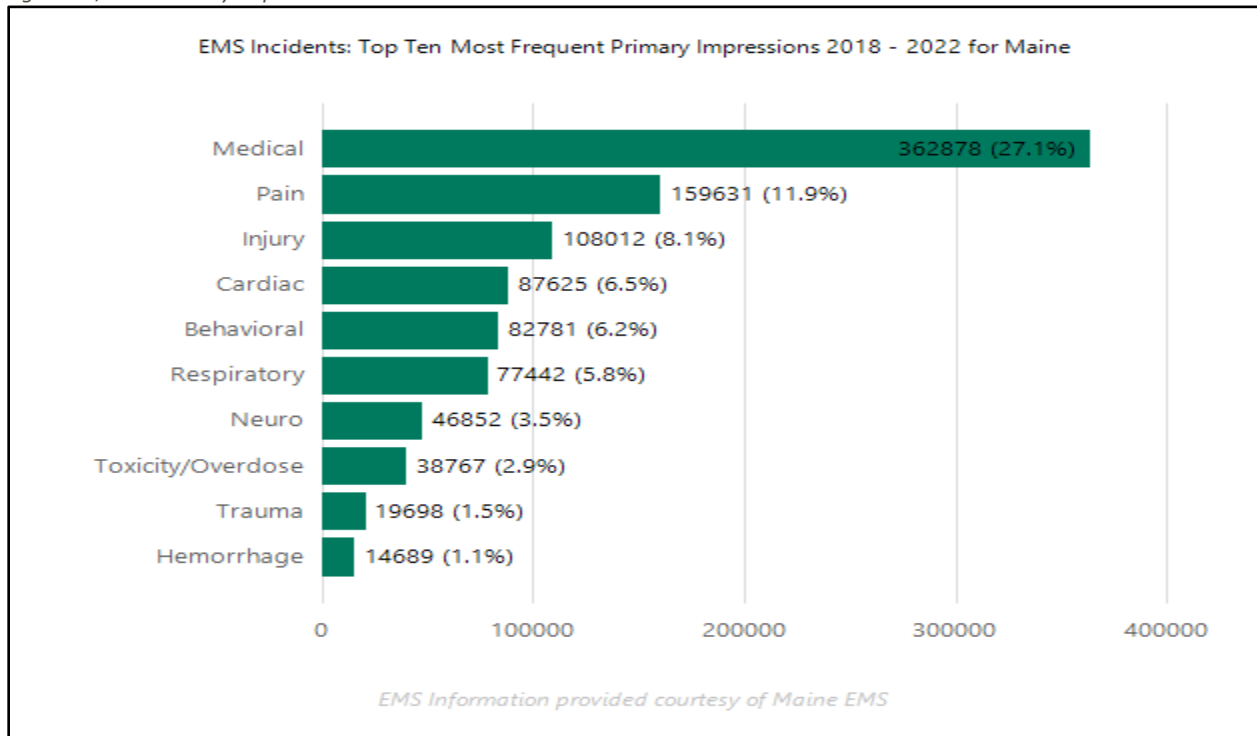
*Map 9, Percent Housing Units Exposed to Wildland Fire Risk and Hazard*



## 5. Emergency Medical Service Calls

EMS units in Maine respond to a considerable number of incidents each year. Incident records for Maine indicate that during 2018 - 2022, there were a total of 1,338,942 patient encounters (consisting of 840,360 incidents); resulting in an annual average of 267,788 patients. Patient gender consisted of 43.83% males and 47.83% females. Ages ranged from 0 to 123 years of age, with an average age of 56 (median 63). Female patients averaged 62 years and males 59. Pediatric patients, age 17 or younger, comprised 12.58% of the patients. The top 10 incidents, by primary impressions.<sup>9</sup> Medical calls can range from an upset stomach, UTI, obesity, etc.

Figure 16, EMS Primary Impressions



<sup>9</sup> Maine EMS data 2018 – 2022. For further information on

Table 6, EMS First Impression 2018-2022

County	Medical	Pain	Injury	Cardiac	Respiratory	Behavioral	Neuro	Toxicity/Overdose	Trauma
Androscoggin	29%	13%	7%	6%	6%	6%	4%	3%	1%
Aroostook	29%	12%	8%	8%	8%	8%	4%	3%	1%
Cumberland	28%	12%	8%	7%	6%	5%	4%	4%	2%
Franklin	26%	13%	9%	7%	6%	6%	4%	2%	2%
Hancock	26%	12%	9%	7%	5%	4%	4%	2%	1%
Kennebec	26%	12%	7%	7%	6%	6%	3%	3%	1%
Knox	26%	11%	11%	7%	6%	5%	3%	2%	2%
Lincoln	26%	12%	10%	8%	6%	4%	4%	2%	2%
Oxford	24%	11%	8%	6%	6%	5%	4%	2%	2%
Penobscot	28%	12%	7%	6%	6%	6%	3%	3%	1%
Piscataquis	28%	11%	9%	8%	7%	5%	3%	2%	2%
Sagadahoc	27%	13%	12%	6%	6%	5%	4%	2%	1%
Somerset	28%	11%	9%	8%	7%	6%	4%	2%	2%
Waldo	26%	11%	9%	8%	7%	6%	4%	2%	2%
Washington	29%	13%	10%	9%	8%	6%	4%	3%	2%
York	26%	11%	9%	7%	6%	6%	4%	3%	2%

## 6. Vehicle Crash Data 2022

According to the National Center for Disease Control and Prevention, motor vehicle crashes are the second leading cause of unintentional injury in the United States.<sup>10</sup> An estimated 58% of vehicle crashes in Maine take place in areas defined by the Maine Department of Transportation as rural. Reflecting the distribution by county you see below.

Table 7, Motor Vehicle Crashes 2022, Counts, Costs, and Rates, Maine Department of Transportation

County	Injuries	Fatals	Total Crashes	Cost	Total MV Crash Injury Rate p/1,000	Total MV Crash Fatality Rate per 1,000	Total MV Crash Rate per 1,000	Combined Rate
Androscoggin	985	11	2,799	\$100,982,100	8.9	0.1	25.4	34.4
Aroostook	388	11	1,405	\$72,224,100	5.8	0.2	20.9	26.8
Cumberland	2,146	26	7,770	\$247,644,600	7.1	0.1	25.8	33.1
Franklin	232	3	889	\$27,517,100	7.9	0.1	30.1	38.1
Hancock	445	15	1,700	\$94,898,400	8.0	0.3	30.7	39.0
Kennebec	1,034	19	3,540	\$143,217,200	8.4	0.2	28.7	37.3
Knox	256	6	821	\$41,157,900	6.3	0.1	20.3	26.7
Lincoln	253	5	850	\$38,393,700	7.2	0.1	24.2	31.6
Oxford	393	9	1,286	\$67,791,500	6.8	0.2	22.2	29.2
Penobscot	1,239	22	4,051	\$171,295,500	8.1	0.1	26.6	34.9
Piscataquis	97	1	363	\$11,876,300	5.8	0.1	21.7	27.5

<sup>10</sup> CDC Injury Prevention and Control, <https://www.cdc.gov/injury/wisqars/LeadingCauses.html>



Table 7, Motor Vehicle Crashes 2022, Counts, Costs, and Rates, Maine Department of Transportation cont'd

Sagadahoc	217	2	712	\$24,054,400	5.9	0.1	19.5	25.5
Somerset	417	12	1,438	\$77,056,300	8.3	0.2	28.5	37.0
Waldo	241	8	943	\$49,789,700	6.1	0.2	23.8	30.1
Washington	190	9	610	\$51,191,200	6.1	0.3	19.7	26.1
York	1,530	27	4,748	\$214,183,700	7.3	0.1	22.6	30.0
Statewide	10,063	186	33,925	\$1,433,273,700	7.4	0.1	24.9	32.6

## 7. United States and Maine CDC Data on Unintentional injury

Poisoning and falls are two of the most frequent unintentional injuries resulting in death. According to the U.S. CDC, there were 583 poisonings and 346 fall deaths in 2021 in Maine. Of those falls, 325 involved individuals 65 and over. The fall numbers make sense given Maine's aging population and may account for some poisonings involving pharmaceuticals. The combined costs (Medicare, Medicaid, and other related costs) of poisoning and falls for all ages were estimated to be \$6.5 billion for poisoning and \$1.2 billion for falls. Likewise, the costs of motor vehicle fatalities are high at \$1.7 billion.<sup>11</sup>

Table 8, National Center for Injury Prevention, US CDC, WISQARS, Cost of Injuries, Maine, All Ages

Mechanism	Intent	Deaths	Combined Costs Total	Combined Costs Average
Drug Poisoning	Unintentional	583	\$6,657,755,263	\$11,419,820
Fall	Unintentional	346	\$1,201,277,366	3471899.9
Motor vehicle, traffic	Unintentional	172	\$1,745,886,986	\$10,150,506
Non-Drug Poisoning	Unintentional	54	\$610,387,239	\$11,303,467

Table 9, National Center for Injury Prevention, US CDC, WISQARS, Cost of Injuries, Maine, 65 and older

Mechanism	Intent	Deaths	Combined Costs Total	Combined Costs Average
Fall	Unintentional	325	\$957,045,122	\$2,944,754
Poisoning	Unintentional	22	\$132,981,719	\$6,044,624
Motor vehicle, traffic	Unintentional	50	\$249,261,800	\$4,985,236

## 8. Natural Hazards

Natural hazards are defined as environmental phenomena that have the potential to impact societies and the human environment. FEMA's Natural Risk Index looks at 10 natural hazards as shown below in Table 10. Maine's overall risk level for natural hazards is low, to very low, compared to all states. There are some exceptions in various counties to certain types of hazards. Cumberland and York counties are at the greatest risk from a natural hazard in Maine. That's

<sup>11</sup> National Center for Injury Prevention, US CDC WIQARS

primarily driven by population and annual losses. All of Maine’s counties score relatively high, too high, in community resilience. A factor that lowers the impact of events.

Table 10, Natural Hazard Risk, FEMA, National Risk Index

	Overall Index Score	Cold Wave	Coastal Flooding	Hail	Hurricane	Ice Storm	River Flooding	Strong Wind	Wildfire	Winter Weather	Ave Risk
Androscoggin	67.3	39.8	0.0	19.8	84.8	94.7	54.2	22.8	49.5	5.6	41.2
Aroostook	60.5	90.4	0.0	16.9	77.6	73.8	76.3	29.7	41.9	50.2	50.8
<b>Cumberland</b>	<b>85.1</b>	52.0	75.9	36.7	90.0	98.1	83.3	34.1	63.6	8.5	<b>60.2</b>
Franklin	38.7	67.4	0.0	11.0	76.0	85.5	51.9	25.9	38.1	52.2	45.3
Hancock	69.1	40.0	81.7	24.8	84.3	94.6	34.1	17.5	13.0	51.2	49.0
Kennebec	77.5	58.1	54.7	32.4	87.6	97.8	67.6	34.8	57.1	79.6	63.3
Knox	50.5	32.5	67.4	9.7	80.2	92.4	29.8	11.5	40.8	2.9	40.8
Lincoln	50.8	32.8	71.4	11.9	79.6	92.0	27.3	7.6	43.0	2.9	40.9
Oxford	60.0	74.0	0.0	14.6	81.8	88.3	77.6	26.7	47.8	24.5	48.4
Penobscot	73.4	57.9	35.4	37.0	85.1	97.3	69.0	16.0	51.5	73.8	58.1
Piscataquis	17.6	44.4	0.0	5.5	71.1	64.6	42.1	8.0	26.2	16.1	30.9
Sagadahoc	30.3	32.2	68.4	6.8	73.4	89.9	15.0	5.4	36.8	2.6	36.7
Somerset	67.7	76.2	0.0	16.0	83.1	93.2	78.6	19.5	47.2	36.2	50.0
Waldo	52.6	54.6	68.6	30.8	79.5	92.5	26.4	18.6	42.1	61.6	52.7
Washington	57.7	38.5	77.1	6.3	80.3	90.2	30.4	8.7	8.0	32.1	41.3
<b>York</b>	<b>83.6</b>	41.9	81.3	33.3	88.8	98.8	82.6	41.4	63.4	9.5	<b>60.1</b>

### Prioritization

State/county level data has only partial value for localities undertaking a community risk reduction program. The frequency of incidents at the county level will not represent local frequencies. The profile of a county is less likely to accurately reflect a local profile. Incident counts by type and community profiles will need to be tallied at the local level. In addition, when reviewing incident data from the local perspective, factor in average statewide costs as well.

However, the county level data can serve as a guide as to what kind and what source of data you should examine at a minimum. The county level data can also provide estimates on the average costs of loss (life, injuries, property and response costs). Localities can use estimates to measure the impact. Table 11 below shows the combined medical and statistical value of life costs associated with the list of unintentional injuries. From a local perspective, multiply the estimated combined cost average to arrive at a value of the impact on a locality in terms of fatality by incident type mechanism. From a state/county view, the combined total cost is a better measure of impact.

Table 11, National Center for Injury Prevention and Control, 2021 Maine

Mechanism	Combined Cost Average	Combined Total Cost
Cut/Pierce	\$10,361,031	\$51,805,155
Drowning (includes water transport)	\$33,923,925	\$330,218,130
Drug Poisoning	\$50,502,369	\$6,968,974,422
Fall	\$12,712,931	\$1,247,482,521
Fire/Flame	\$35,188,831	\$231,665,791
Firearm	\$63,348,391	\$1,856,130,031
Machinery	\$13,277,683	\$53,110,733
Motor vehicle, traffic	\$10,150,506	\$1,745,886,986
Natural/Environmental	\$6,970,838	\$76,679,219
Non-Drug Poisoning	\$25,156,673	\$668,501,319
Other specified / NEC	\$31,872,125	\$66,552,378
Other specified and classifiable	\$39,914,717	\$109,517,057
Pedestrian, other	\$11,623,675	\$58,118,373
Struck by / against	\$8,256,234	\$74,306,109
Suffocation	\$32,043,976	\$1,054,358,918
Transport, other land	\$20,756,834	\$112,314,862
Unspecified	\$27,064,869	\$168,190,632

### Community Risk Priorities

Community Risk Priorities are based on three variables which include:

1. Incident Types: What types of incidents are being responded to, their frequency, and the impact of these incidents or associated identifiable costs.
2. Community Profile: What is the population, housing, and infrastructure composition in your community.
3. Capacity: What can the fire department and other first responders do to address the risk given current staff capacities, equipment, training and available partnerships.

#### Priority 1: Falls

Falls in the home are common and the cost of responding with apparatus and personnel can be high. The medical costs are also considerable. There were an estimated 80,000 or more falls reported in 2020 and 346 deaths among those 65 and older in 2021. These older adults comprise 22% of the state’s population and that population is forecast to grow through to 2030. Older adults comprise a greater percentage of the population in the more rural counties, though the number of older adults is greater in urban areas. The response times to fall incidents are also greater in the more rural areas than urban areas. In addition, many older adults live in isolation so their condition in terms of mobility might be limited, and they may not be able to contact

someone when they have an emergency. There are potential partnerships with or assistance available to help prevent falls through five Area Agencies on Aging in Maine. These agencies can help direct resources related to health, mobility and isolation to older adults in Maine. In addition, these agencies provide classes on falls prevention and other related programming. Again, four of the five agencies are in the more populated southeastern portion of the state. One is in Aroostook County. Home care options can be scarce in Maine in more rural areas. The Maine Department of Health and Human Services, Office of Aging and Disability Services can provide guidance for home care services. In home services are funded through MaineCare, the state's Medicaid program or through state funded programs for those in need. Maine's American Association of Retired Persons (AARP) chapter provides links to resources throughout the state and information to prevent falls. EMS, fire and ambulance service organizations respond to these incidents as well. Transportation to available medical facilities for emergency care varies throughout the state.

### Priority 2: Home Structure Fires

Structure fires are the leading type of fire incident types comprising an average 48% to 50% of fires annually. Seventy-nine percent of these fires will be in a residential occupancy and 91% of those in a home (single family unit, mobile home, or apartment unit). These home structure fires account for 85% of fire fatalities and an average of 48% to 50% of the fatalities are people 65 and older. As previously stated, Maine's older adult population comprises 22% of the total population and is forecasted to grow through 2030. In addition, many older adults live in isolation so their condition in terms of mobility might be limited. Seventy-seven percent of firefighter injuries will occur in a home fire. Home fires also cost more than any other type of fire. Though more people will die in homes in urban areas, the rate of deaths is higher in rural areas of the state. Maine's housing stock is, like many of the eastern states, some of the oldest. Subsequently, many homes are not up to date with the latest fire mitigation systems especially hardwired interconnected fire alarms. They also have older wiring, and egress is not up to current Life Safety Code standards. Few are sprinkled. The response times to home fire incidents are greater in the more rural areas than in urban areas. In terms of fire safety and prevention, and partnership and capacity; the rural areas are in greater need of adequately staffed, trained, and equipped fire departments. These departments are likely unable to staff and implement a fire safety program, such as a fire alarms installation program. The fire department and Red Cross are likely partnerships that would routinely conduct a smoke alarm installation program. Grants, such as the Assistance to Firefighters Grant, provide funding for both staff and equipment. The Fire Prevention and Safety Grant is also available each year to fund fire safety programming.

### Priority 3: Vehicle Crashes

In 2022, there were 33,925 vehicle crashes in Maine killing 186 and injuring another 10,063 others. The total estimated cost of vehicle crashes is \$1.4 million. Though the crash rate and injuries are higher in urban counties, fatality rates are higher in the more rural areas lead by Washington, Hancock and Aroostook counties. Speed is the leading contributing factor in those fatalities. Maine is the largest state, geographically, in New England. It has thousands of miles

of country roads, corridors and interstates connecting people and commerce to communities throughout the state. Because many of Maine's rural communities have declining populations, there are fewer businesses in those communities. Many residents of Maine's communities travel elsewhere to work with the primary means of travel being a car, truck, or van. Average commuting time one-way is twenty-three minutes. Road conditions impact safety and the condition of Maine roads depends largely on the state and local government's ability to pay for maintenance. Forty-four percent of Maine's roads are rated in poor to mediocre condition. State and local police departments patrol Maine's highways imposing a negative economic incentive with citations to control speeding vehicles. They also respond to accidents and assist in the coordination of response with other local agencies such as Maine's fire departments. In addition, LifeFlight air ambulance and ground support is there for the most severe crashes expediting the transportation of critically injured to medical centers. The partnerships of emergency response are in place. Maine's Department of Highway Safety administers Highway Safety Funds from the National Highway Traffic Administration to plan, implement, and evaluate highway safety programming. They work with federal, state and local organizations involved in traffic safety.

### **Addressing these Priorities – The Maine Fire Service Crisis**

Fire Departments in Maine and across the nation are taking a lead in Community Risk Reduction. It's essentially what they've been doing for centuries. The major difference with community risk reduction is its focus on prevention and response. Fire departments enjoy great regards in the community, and they are present in most communities. There are an estimated 320 active departments in Maine. Despite these strengths, many fire departments are struggling.

Departments in Maine, particularly those in rural areas, are facing a crisis of personnel recruitment, retention and training. These fire departments are falling victim to a declining volunteer firefighters *and* emergency response capacity due to a confluence of factors. Some common examples are (1) an aging population; (2) commuting workforces; (3) increased training and regulatory requirements; (4) cultural shifts; and (5) employer/employee disagreements over time allowances for volunteer work in emergency response. The rising median age of Maine only exacerbates this issue and drives an increased need for such services, simultaneously. Without intervention, it is likely that in the next five to ten years, many rural volunteer fire departments in Maine will be forced to shut their doors. The availability of a rural volunteer fire response will dwindle. This will put an undo regional burden on departments that remain in operation. Emergency services will be stretched thin in places that rely on mutual aid, and in those areas that provide it, leaving the state of emergency response uncertain; especially in some of the most rural and underserved spaces. Hancock County and Maine more broadly, are not alone in this plight, however, this is a trajectory perfectly in line with national and international trends regarding the state of the volunteer fire service.