

EXECUTIVE SUMMARY:

In Maine, climate change has already dramatically changed our landscape, biodiversity, and health. The interdependence of our communities, our natural resources, and our economy will all be challenged soon without adequate mitigation planning and action. Communities face condensed winters and hotter summers, increased heat index-related health issues, increased frequency of severe storms, increased exotic or invasive insects, disruption of aquatic ecosystems in the Penobscot Bay, as well as diseases that threaten our idyllic and diverse wildlife and forests.

Since the 2016 Hazard Mitigation Plan update, Penobscot County has endured two disaster declarations. In 2018, federal declaration DR-4354-ME resulted from a severe windstorm and flooding in October 2017. Additionally, in 2020, the USDA designated Penobscot County as a primary natural disaster area due to extensive drought over the summer.

For twenty-five years, the National Institute of Building Sciences has been performing and reporting out the results of disaster dollars avoided by using pre-disaster mitigation investments, now known as the Building Resilient Infrastructure and Communities (BRIC) program. The results continue to show that every \$1 invested in disaster mitigation results in \$6 of avoided disaster damages.

With the United States rejoining the Paris Agreement in 2021, now is the time for grassroots, whole community effort to address climate change here in Penobscot County. Local communities must implement strategic mitigation projects that will reduce repetitive losses from natural disasters, thus strengthening our resiliency.

We are pleased to present the Penobscot County Multi-Jurisdictional Hazard Mitigation Plan for 2021.

SECTION I - OVERVIEW

PURPOSE

The purpose of mitigation planning within Penobscot County is to ensure our local municipalities, tribal governments, and unorganized territories are taking appropriate measures to identify and rank vulnerabilities and risks of communities based on the severity and probability of recurring natural hazards, assess local capabilities that can address these risks, and highlighting mitigation actions and implementation strategies that reduce long-term risks and losses associated with disaster response and recover. identify and rank their risks and vulnerabilities on the severity and probability of reoccurring natural hazards; identify and strategically plan for repetitive loss of private property, and public sector critical infrastructure to promote more resilient and sustainable communities; and reduce the costs associated with disaster response and recovery.

This Plan fulfills the requirements of the Federal Disaster Mitigation Act of 2000, which mandates that all localities that seek to continue receiving Federal Emergency Management Agency (FEMA) grant funding participate in a FEMA-approved hazard mitigation plan. Pursuant to §201.6 of the Interim Final Rule prepared by FEMA, Penobscot County Emergency Management Agency (the County) decided to update their multi-jurisdictional plan to encompass the concerns of the County and its participating municipalities.

The Penobscot County Multi-Hazard Mitigation Plan (MJHMP) identifies natural hazards, assesses the jurisdictions' vulnerability to each hazard, establishes community goals and objectives to reduce their effect, and selects mitigation activities appropriate for Penobscot County and its participating municipalities. The purpose of these activities is to stimulate awareness and actions that will best address Penobscot County's natural hazard vulnerabilities and meet the municipalities' needs in addressing future hazard mitigation and emergency management.

AUTHORITY

The Penobscot County Multi-Jurisdictional Hazard Mitigation Plan - 2021 update has been adopted to satisfy the requirements outlined in Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (P.L. 93-288, as amended) for federal disaster assistance and enacted under the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390).

SCOPE

The scope of this Plan is to identify and address natural hazards and the local government, Indian tribal government, or unorganized territory vulnerability to them. Although the rule criteria for local plans recommend that communities include man-made and technological hazards along with natural hazards, the Penobscot County Emergency

Management Agency decided to review only natural hazards at this time. This Plan will produce a program of activities that will best undertake the county's natural hazards and meet the needs of its communities. Consistent with FEMA planning process guidelines, this Plan will accomplish the following objectives:

- Ensure that activities are reviewed and implemented so that disaster related hazards are addressed by the most appropriate and efficient solution;
- Link hazard management policies to specific activities;
- Educate residents about potential hazards that threaten the County and their communities;
- Build public and political support for projects that prevent new problems from known hazards and reduce future losses;
- Fulfill planning requirements for future hazard mitigation project grants; and
- Facilitate implementation of hazard mitigation management activities through an action plan.

DISASTER MITIGATION ACT OF 2000

On October 30, 2000, the President of the United States signed into law the Disaster Mitigation Act of 2000 (DMA 2000) to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988. This new legislation reinforces the importance of Hazard Mitigation planning to reduce the Nation's disaster losses, and is aimed primarily to control and streamline the administration of federal disaster relief and mitigation programs. The Act encourages and rewards local and state pre-disaster planning, promotes stability as a strategy for disaster resistance, and is intended to integrate state and local planning with the aim of strengthening statewide mitigation planning. In 2020, FEMA released the Building Resilient Infrastructure and Communities (BRIC) notice of funding opportunity to continue to invest in a variety of mitigation activities with an added focus on infrastructure projects and Community Lifelines.

Section 322 (a-d) of DMA 2000, requires that local governments, as a condition of receiving federal disaster mitigation grant funds, have a mitigation plan that describes the process for identifying hazards, risks and vulnerabilities, identify and prioritize mitigation actions, encourage the development of local mitigation and provide technical support.

NATIONAL FLOOD INSURANCE REFORM ACT OF 1994

This Plan fulfills the requirements of the National Flood Insurance Reform Act of 1994 (NFIRA). With this Act, Congress authorized the establishment of a federal grant program to provide financial assistance to states and communities for flood mitigation planning and activities. The Federal Emergency Management Agency (FEMA) has designated this Flood Mitigation Assistance (FMA).

Under the FMA, FEMA assists states and communities for activities that will reduce the risk of flood damages to structures insured under the National Flood Insurance Program (NFIP). FMA is a state-administered, cost-share program through which states and

communities can receive grants for a flood mitigation plan, technical assistance, and flood mitigation projects.

CONSULTANT

In 2005 Penobscot County contracted with Eastern Maine Development Corporation (EMDC) to assist in preparing the Penobscot County Multi-Jurisdictional Hazard Mitigation Plan. For the 2011 update and again in 2015, Lorna Thompson Consulting, LLC assisted Penobscot County with the necessary steps to review the Hazard Mitigation process and LatLong Logic, LLC provided mapping expertise.

For the 2021 update, Penobscot County Emergency Management Agency (PTEMA) managed the revision of the Plan internally as there were no updated requirements from the previous Federal Emergency Management Agency (FEMA) *Local Mitigation Plan Review Guide, 2011*, or the *Local Mitigation Planning Handbook, 2013*, that would need to be addressed since our 2015 previously approved Penobscot County Multi-Jurisdictional Hazard Mitigation Plan.

Working directly with the municipalities and the committee representatives, data was collected and analyzed for hazard identification and vulnerability. Penobscot Emergency Management Agency (PTEMA) with assistance from Maine Emergency Management Agency (MEMA) created a document consistent with Federal Emergency Management Agency guidelines for Hazard Mitigation and Federal Mandate §201.6.

LIMITATIONS

The MJHMP has been compiled as a result of reviewing the most recent and best-available federal, state, and local guidance, scientific data, and professional recommendations with sources cited. With that said, there are certainly other science-based, climate change reference material, and professional experts that could have been drawn upon to strengthen the Plan. Where appropriate, the future application of the information contained in this plan should be preceded by a check of the sources to see if additional or revised information is available.

The information used to create the maps contained within this Plan were derived from multiple sources to provide a general outline and understanding of the complexity, and the interface between municipalities and the surrounding natural resources. This product, as provided, is for reference and planning purposes only and is not to be construed as a legal document or survey instrument. This information is provided to understand that it is not guaranteed to be accurate, that it is subject to revision, and conclusions drawn from such information are the users' responsibility.

METHODOLOGY

The methodology used for the development of the Penobscot County Hazard Mitigation Plan consists of the following tasks:

- Public involvement
- Coordination with other agencies or organizations
- Natural hazard area inventory
- Problem identification
- Review and analysis of possible mitigation activities and projects
- Local Plan adoption and implementation following FEMA “approval pending adoption”
- Periodic review and update of the plan

This Plan summarizes the activities outlined above to assess the consequences of the varying natural hazards within Penobscot County to include recommended mitigation activities. The MJHMP contains a list of potential projects and an implementation strategy to identify responsible parties and time frames.

The MJHMP will be updated, as appropriate, when a disaster occurs that significantly affects one or more jurisdictions within Penobscot County whether or not it receives a Gubernatorial or Presidential Declaration. The update will be completed as soon as possible, but no later than 12 months following the disaster. Otherwise, Plan updates will follow a 5-year cycle as set forth by requirements of the Stafford Act and Title 44 Code of Federal Regulations §201.6(d)(3). Routine maintenance of the Plan will include:

- Updating hazard profiles by identifying new risks experienced by participating jurisdictions
- Adding mitigation actions/projects as new risks emerge or new funding sources become available.
- Indicating all projects that have been completed.
- Updating the status of existing projects that were deferred due to lack of funding.

GEOGRAPHY

Penobscot County is located in North Central Maine, and borders on Piscataquis and Somerset Counties on the West, Aroostook County to the North, Waldo County to the South and Washington and Hancock Counties on the East. The Penobscot River, Maine’s longest river, runs southerly through the county and runs into the Atlantic Ocean at the mouth of the river in Penobscot Bay. Penobscot County is one of Maine’s largest counties, covering over 3,345 square miles. The county seat, Bangor, is located in the southeastern corner of the county, and is connected to major transportation and the remainder of the county, with Interstate 95 traveling directly through as the major corridor.

LAND AREA AND DEVELOPMENT

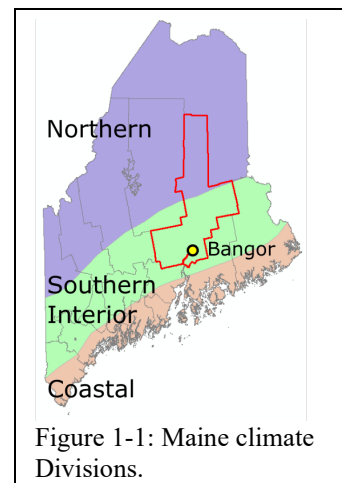
There are 60 municipalities and one sovereign nation within Penobscot County. Approximately 75 percent or 2668 square miles of the land area of the County are forested, 23 percent is agricultural or open space and 2 percent is classified as urban. Development is heaviest along the corridor of Interstate 95 and the Penobscot River. Select areas along this corridor within the county have become urbanized, most of which have many homes, businesses, and schools. Development within the remainder of the county consists of scattered communities, recreational properties, and timber harvesting.

CLIMATE

Penobscot County's northeastern climate is four seasons and highly changeable -- it can go from sunny to stormy in short order. However, the climate of Penobscot County is primarily cool and humid. Summers in the Penobscot Region, are relatively cool, with highs in the 70's or sometimes reaching the low 80's. Interior areas experience a large range of temperatures in the summer, with some nights in northern areas near freezing shortening the average growing season to 156 days. Winters in Penobscot County are cold and often frigid. January temperatures range from the low teens to mid-thirties towards the coast and zero to the mid-teens the further one travels inland. Continuous snow is generally on the ground from December through February and sometimes from November into March, with occasional snow storms still occurring in April.

The area around the county receives a mean annual precipitation of 239 centimeters, which is the water equivalent of 94 inches of snow. The precipitation is rather evenly distributed throughout the year; however, snowmelt accounts for a large part of the runoff. The mean annual temperature of the county is approximately 41 degrees (Fahrenheit), ranging from means of 19.3 degrees in January to 66.5 degrees in July. Daytime highs gradually increase March through May. In September, the spectacular hardwood colors of fall blaze with sunny cool days and chilly nights.

Since the county is large, weather conditions can vary greatly. As an example, the northern portion of the county lies within the Northern Climate Division and the southern portion of the county is in the Southern Interior Division (Figure 1-1). It is not unusual for Northern Penobscot County to be receiving snow while Southern Penobscot County is receiving rain.



DEMOGRAPHICS

The 2020 U.S. Census showed a total population for Penobscot County at 152,199, which is a decrease of about -1.12% since the 2010 Census. Jurisdictions in northern and eastern Penobscot County experienced population decline, while many jurisdictions adjacent to the City of Bangor and in southern Penobscot County experienced net population gains (Figure 1-2). County-wide housing units increased to 74,878, which is an increase of

about 1.38%. About 18% of the county's population was under 18 years old, 4.7% of the total population was under the age of 5, and 19.1% of the population was 65 or older. General demographics information was compiled from the 2020 U.S. Census and the 2019 American Community Survey data.

PENOBSCOT COUNTY GENERAL DEMOGRAPHICS		2010	2020
Area		3,397 sq. miles	3,397 sq. miles
Population		153,923	152,199
Median age		39.9 years	42 years
Total housing units		73,860 units	74,878 units
Occupied year-round housing units		62,966 units	64,250 units
Average household size		2.33 people	2.37 people
People per square mile		45.3 people	44.8 people
Occupied housing units per square mile		21.7 units	22.04 units

In 2010 U.S. Census demographics showed a total population for Penobscot County at 153,923 and increase of about 5.8% since the 2000 Census. County-wide housing units increased to 73,860 which is an increase of about 9.5%. About 20 percent of the county's population was younger than 19 years old, 5.2 percent of the total population was under the age of 5, and 14.5 percent of the population was 65 or older.

Of the county's 73,860 total housing units in 2010, about 62, 966 were occupied and 14.7 percent (or 10,894 units) of all housing units were vacant with 6,199 of those vacant units being of seasonal or recreational use.

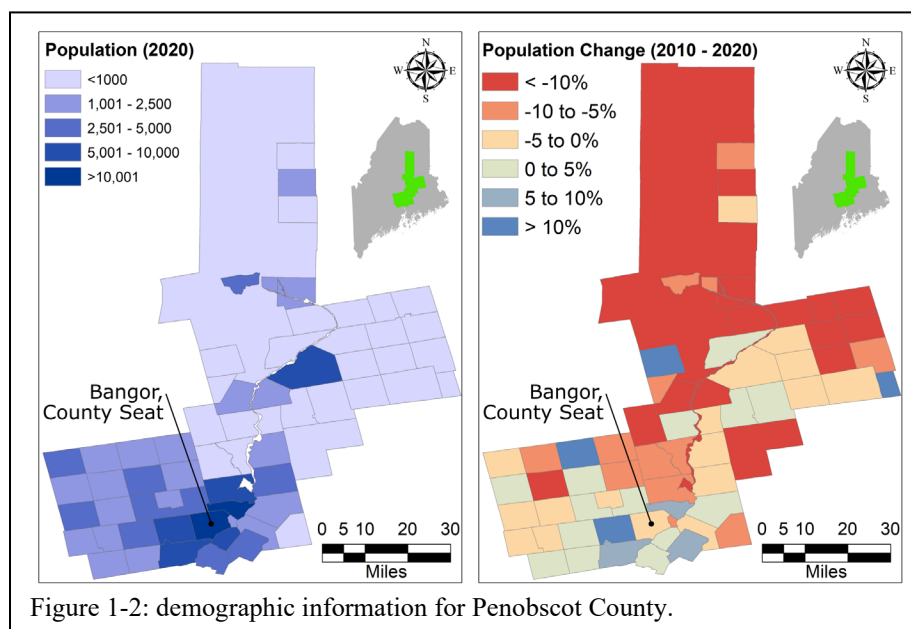


Figure 1-2: demographic information for Penobscot County.

The Table below shows general demographic information for the individual communities in Penobscot County based on the 2010 and 2020 U.S. Census::

PENOBSCOT COUNTY DEMOGRAPHICS								
BY COUNTY SUBDIVISION 2020 CENSUS								
County Subdivision	Land Area (sq. mi.)	2010 Population	2010 Persons (sq.mi.)	2010 Total Housing Units	2020 Population	2020 Persons (sq. mi.)	2020 total housing units	2010-2020 Population % Change
Alton town	42.32	890	21.03	385	829	19.59	395	-6.85%
Argyle UT	26.64	277	10.40	146	255	9.57	140	-7.94%
Bangor city	34.26	33039	964.38	15674	31753	926.84	15900	-3.89%
Bradford town	41.18	1290	31.32	583	1184	28.75	564	-8.22%
Bradley town	49.52	1492	30.13	719	1532	30.93	738	2.68%
Brewer city	15.24	9482	622.25	4457	9672	634.72	4511	2.00%
Burlington town	54.01	363	6.72	410	373	6.91	369	2.75%
Carmel town	36.53	2794	76.48	1182	2867	78.48	1253	2.61%
Carroll plantation	43.95	153	3.48	138	138	3.14	109	-9.80%
Charleston town	40.55	1409	34.74	546	1551	38.25	563	10.08%
Chester town	45.83	546	11.91	266	549	11.98	263	0.55%
Clifton town	34.53	921	26.67	468	840	24.33	444	-8.79%
Corinna town	38.71	2198	56.78	1075	2221	57.37	1093	1.05%
Corinth town	40.27	2878	71.47	1233	2900	72.01	1249	0.76%
Dexter town	35.14	3895	110.84	2141	3803	108.22	2134	-2.36%
Dixmont town	36.29	1181	32.54	557	1211	33.37	549	2.54%
Drew plantation	38.03	46	1.21	36	26	0.68	34	-43.48%
East Central Penobscot UT	114.48	343	3.00	320	308	2.69	278	-10.20%
East Millinocket town	7.10	1723	242.83	871	1572	221.55	864	-8.76%
Eddington town	24.99	2225	89.04	1037	2194	87.80	1062	-1.39%
Edinburg town	35.01	131	3.74	69	134	3.83	64	2.29%
Enfield town	27.73	1607	57.94	937	1435	51.74	891	-10.70%
Etna town	24.81	1246	50.23	559	1226	49.42	576	-1.61%
Exeter town	38.56	1092	28.32	491	963	24.97	495	-11.81%
Garland town	37.67	1105	29.33	552	1026	27.24	541	-7.15%
Glenburn town	27.16	4594	169.14	2018	4648	171.13	2063	1.18%
Greenbush town	43.80	1491	34.04	725	1444	32.97	701	-3.15%

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Hampden town	37.94	7257	191.28	3030	7709	203.20	3255	6.23%
Hermon town	35.87	5416	150.98	2210	6461	180.11	2619	19.29%
Holden town	31.32	3076	98.21	1480	3277	104.62	1546	6.53%
Howland town	34.94	1241	35.52	639	1094	31.31	568	-11.85%
Hudson town	37.64	1536	40.81	786	1416	37.62	780	-7.81%
Kenduskeag town	16.75	1348	80.46	600	1346	80.34	627	-0.15%
Kingman UT	25.01	174	6.96	117	137	5.48	104	-21.26%
Lagrange town	49.47	708	14.31	380	635	12.84	348	-10.31%
Lakeville town	58.35	105	1.80	453	104	1.78	392	-0.95%
Lee town	38.67	922	23.85	546	916	23.69	538	-0.65%
Levant town	30.06	2851	94.84	1146	2940	97.80	1238	3.12%
Lincoln town	67.83	5085	74.97	2866	4853	71.55	2683	-4.56%
Lowell town	38.30	358	9.35	315	368	9.61	315	2.79%
Mattawamkeag town	37.73	687	18.21	407	596	15.80	339	-13.25%
Maxfield town	18.93	97	5.12	61	89	4.70	60	-8.25%
Medway town	41.00	1349	32.90	658	1187	28.95	610	-12.01%
Milford town	45.63	3070	67.29	1385	3069	67.26	1429	-0.03%
Millinocket town	15.90	4506	283.31	2586	4114	258.66	2530	-8.70%
Mount Chase town	36.65	201	5.48	297	187	5.10	212	-6.97%
Newburgh town	31.01	1551	50.02	659	1595	51.44	701	2.84%
Newport town	29.51	3275	110.98	1766	3133	106.17	1799	-4.34%
North Penobscot UT	1051.70	463	0.44	1119	405	0.39	903	-12.53%
Old Town city	38.82	7840	201.94	3665	7431	191.40	3745	-5.22%
Orono town	18.18	10362	570.12	3089	11183	615.29	3792	7.92%
Orrington town	24.99	3733	149.37	1612	3812	152.54	1736	2.12%
Passadumkeag town	22.92	374	16.32	197	356	15.53	200	-4.81%
Patten town	38.19	1017	26.63	565	881	23.07	545	-13.37%
Plymouth town	29.73	1380	46.42	615	1325	44.57	631	-3.99%
Prentiss UT	38.18	214	5.60	185	169	4.43	178	-21.03%
Seboeis plantation	40.01	35	0.87	114	40	1.00	74	14.29%
Springfield town	38.48	409	10.63	281	293	7.62	259	-28.36%
Stacyville town	39.53	396	10.02	224	380	9.61	204	-4.04%
Stetson town	35.01	1202	34.33	621	1186	33.87	664	-1.33%
Twombly Ridge UT	44.05	0	0.00	10	0	0.00	7	0.00%
Veazie town	3.03	1919	634.38	884	1814	599.67	857	-5.47%
Webster plantation	36.65	85	2.32	46	68	1.86	44	-20.00%

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Whitney UT	10.91	5	0.46	38	6	0.55	9	20.00%
Winn town	43.70	407	9.31	210	399	9.13	194	-1.97%
Woodville town	42.73	248	5.80	137	201	4.70	127	-18.95%
Sovereign Nation								
Penobscot Nation	7.56	610	80.67	266	370	48.93	173	-39.34%
Total	3,397.20	153,923	45.31	73,860	152,199	44.80	74,878	-1.12%

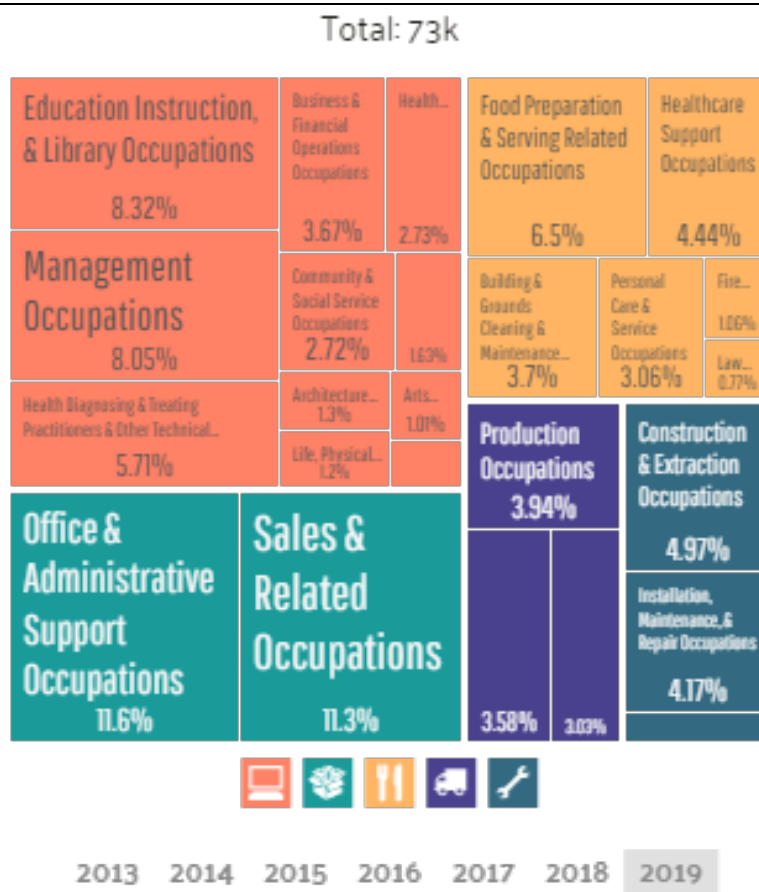
Source: 2010 and 2020 US Census

EMPLOYMENT

For 2009, the leading industries in Penobscot County were educational services, and health care and social assistance at 33% and Retail trade at 14%. Among the most common occupations were Management, professional and related occupations 34%; Sales and office occupations 25%; and Service occupations 21%. 76% of people were Private wage and salary employees and 17 % were Federal, state or local government workers. 80% of Penobscot County workers drove to work alone in 2009. Among all of those who commuted to work in 2019, it took them on average 22.6 minutes to get to work. The median income of households in Penobscot County in 2019 was \$51,941.

For 2013, according to the State's Office of Policy and Management, employment by occupation, Management was the leading category at 34%, with Sales and Office second at 25% and Service third with 20%. These numbers were virtually unchanged when compared to the 2009 information. The most common employment by industry was Education, Health Care and Social Services at 33.8%. About 77% of people were Private wage and salary employees and 16 % were federal, state or local government workers. Again 80% of Penobscot County workers drove to work alone in 2013. Among all of those who commuted to work, it took them on average 22 minutes to get to work. The 2013 estimated median income of households in Penobscot County was \$43,734.

The economy of Penobscot County, Maine employs 73,000 people. The largest industries are Health Care & Social Assistance (15,326), Retail Trade (11,057), and Educational Services (10,259). The median income of households in Penobscot County was \$50,808. Employment by occupations are depicted in the graph below.



Source: DataUSA

GOVERNANCE

County Government

The County Seat is located at 97 Hammond Street in Bangor. The County Government consists of the County Commissioners, County Sheriff's Department and County Jail, County Clerk's Office, County Treasurer's, Registrar of Deeds, Probate Judge, Assistant District Attorney, and the Emergency Management Agency. County government has no regulatory authority over the communities within its jurisdiction.

Local Units of Government

There are a number of different kinds of local units of government in Penobscot County. The following summary is based in part on the Maine Municipal Association's report "Local Government in Maine."

Cities: All cities in Maine have local charters granted by the Maine Legislature that provide for a representative form of government - meaning they have a city council that serves as the legislative body. The city council is elected by and answerable to the citizens. The

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office of mayor varies considerably from city to city, with only a few acting as chief executive officer. Some mayors are elected by the vote of the people, while others are elected by a vote of their fellow councilors.

Towns: Penobscot County contains 60 organized towns. Towns remain the cornerstone of local government. A Maine community becomes a town when it is incorporated by a special act of the legislature. At that time, it is given certain privileges and responsibilities. Under Home Rule, towns may take any action or change their form of government in any way not denied or precluded by state or federal law. The voters of the town constitute its legislative body. Day-to-day governance of towns has expanded from the original board of selectmen to include town managers, town councils, budget committees, municipal departments and various professional managers. In a small number of mostly larger towns, the council exerts legislative control without a town meeting. In others, a ballot vote is used to approve the budget rather than the open town meeting.

Plantations: There are 4 organized plantations in Penobscot County. Plantations are a type of local government unique to Maine. They originated with the Massachusetts Bay Colony, and were at first intended to be a temporary government to help guide a community in changing from an unincorporated township to an incorporated town. In Maine, they have continued as a basic governmental unit in small rural areas. Plantations are typically rural, heavily forested, and sparsely populated. There is little demand in them for the full menu of public services provided in larger communities. Plantations are similar to towns in that voters at the annual meeting are the legislative body. During the meeting, assessors are elected to carry on the daily operation of government and function much as the selectmen in towns. Taxes are raised and appropriated and voters are registered. Plantations do not have the powers granted to municipalities under Home Rule, and do not have the authority to enact ordinances.

Townships/Unorganized Territory: There are 39 unorganized townships in Penobscot County. Maine is unique among eastern states in having half its land mass, or more than 10 million acres, in its Unorganized Territory. Most of it is in the northern and easternmost counties. There is no local government. For the people living in the Unorganized Territory, taxes are paid to the State. The State's Land Use Planning Commission (LUPC) establishes basic rules. Services are provided by the state, by counties and by contracts with nearby towns and school districts.

Sovereign Nation: The one Sovereign Nation within Penobscot County is the Penobscot Indian Nation. Indian tribes have their own form of government with sovereign powers that are separate from federal and state governments. According to Felix Cohen's *Handbook of Federal Indian Law*, tribal sovereignty is described:

as a consequence of the tribe's relationship with the federal government, tribal powers of self-government are limited by federal statutes, by the terms of the treaties with the federal government, and by restraints implicit in the protectorate relationship itself. In all other respects the tribes remain independent and self-governing political communities. Section 6206(1) of the Maine Implementing Act provides:

Except as otherwise provided in this Act, ...the Penobscot Indian Nation, within their respective Indian territories, shall have, exercise and enjoy all the rights, privileges, powers and immunities, including, but without limitation, the power to enact ordinances and collect taxes, and shall be subject to all the duties, obligations, liabilities and limitations of a municipality of and subject to the laws of the State, provided, however, that internal tribal matters, including membership in the respective tribe or nation, the right to reside within the respective Indian territories, tribal organization, tribal government, tribal elections and the use or disposition of settlement fund income shall not be subject to regulation by the State.

The Maine Implementing Act also grants to the Penobscot Indian Nation the state constitutional status of a municipality under Maine law.