DANE COUNTY PLANNING & DEVELOPMENT

2022 Dane County Farmland Preservation Plan

Volume II
Agricultural Inventory

As adopted by the Dane County Board of Supervisors
December 15, 2022

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AGRICULTURAL INVENTORY & TRENDS

I. Overview of Dane County Agriculture

As of 2017, Dane County had 506,688 acres of land in agricultural use, representing 64% of the total land area of the county. That year, 2,566 identified agricultural operations produced over 15 different crops. Corn (202,099 acres), hay (64,008 acres) soybean (96,895 acres), and wheat (10,452 acres) were among the predominate crops in land area. In 2017, Dane County had the 2nd largest cattle herd (155,725 head) in the state[1]. As of 2020, it is estimated that Dane County had an average of 53,000 dairy cows, which produced a total of 1.5 billion pounds of milk that year. Dane County also maintains significant livestock numbers of chickens, hogs and pheasants.

According to the US Census of Agriculture, Dane County continues to lead the state in total market value of agricultural products. In 2017, Dane County products sold for over $509 million, the highest for any county in Wisconsin, and in the top 3% for agricultural counties nationwide. Dairy, grain and cattle accounted for 90% of the total value of products sold in 2017. In contrast, in 2017, Dane County farmers earned $470 million for dairy, grain and cattle accounting for approximately 77% of total that year (top 2% of the country). Perhaps in response to the volatility of traditional commodity prices, Dane County farmers have learned to diversify. In 2017, Dane County was in the top 25% of U.S. counties in market value of thirteen different commodity groups, including specialty crops such as Christmas trees, sheep, goats, horses and horticulture. Meanwhile, the traditional Dane County cash crop staple, tobacco, continued to decline due to decreased demand.

Item	Dollars	State Rank	US Rank	US Percentile
Total value of agricultural products sold	509,073	1	97	96.9
Value of crops including nursery and greenhouse	185,013	2	168	94.5
Value of livestock, poultry, and their products	324,059	2	88	97.1

Table 1: Market value of agricultural products sold, 2017

While economically robust, Dane County's agriculture faces significant challenges. Competition with urban, suburban and other uses threatens the agricultural land base. Between 2020 and 2050, the Wisconsin Department of Administration estimates that the Madison Metropolitan Area will add over 88,000 more people, more than anywhere else in Wisconsin. Conservative estimates suggest that Dane County has lost 5,000 acres of farmland to urban, suburban or rural development between2010 and 2020. Recent development trends have slowed, but could rebound as the real estate market recovers. In addition, drastic commodity price fluctuations, competition on a

[1]National Agricultural Statistics Service, USDA, 2017 Agricultural Census

global marketplace, capital investment needed for modernization and challenges in transferring farms to a new generation create an uncertain future for farming in Dane County.

II. Agricultural Inventory

1. Agricultural Land Uses

A. Dane County Land Use Inventory

(1) Data Collected

Land uses were identified through a combination of field surveys and aerial photography. Map FPP-1 shows the 2020 rural and urban land uses in Dane County. An improvement from the previous version of the plan is that the satellite imagery data has gotten better and land use was mapped more accurately in 2020. Some of the land marked as farmland loss in 2020 was a consequence of this better mapping, with windbreaks and access paths excluded from agricultural use.

(2) Types of Agricultural Land Uses

In 2020, agricultural uses accounted for 377,913 acres, or 49% percent of the total land area of the county. Corn, soybean and hay were the most extensive cultivated crops, together accounting for 87% percent of all land in agricultural use. Woodlands (including both managed and unmanaged forest) and other open space (including grasslands, set-asides and other non-cultivated, ungrazed lands) were not included in these totals. Tobacco, vegetable and fruit crops together accounted for less than 1 percent of agricultural land uses. The rest of the land was used for other farm structures, grain elevators and livestock operations. Oilseeds (not including soybean) and potato farming have seen an increase and aquaculture has seen a decline from the last review in 2010.

LUCODE	DESCRIPTION	Acres	% of Total Land in Ag. Use
8120	Corn farming	190,079	50.30%
8121	Soybean farming	86,079	22.78%
8125	Hay/Alfalfa farming	60,654	16.05%
8148	Pasture	11,443	3.03%
8122	Wheat farming	10,661	2.82%
8119	All other farm related buildings	3,635	0.96%
9400	Fallow Farm Field	2,978	0.79%
8141	Dairy cattle and milk production	2,492	0.66%
8110	Farms residence and driveway/access road	2,119	0.56%
8191	Nursery and tree production	1,783	0.47%
8142	Beef cattle ranching and farming, including feedlots	960	0.25%

8112	Farm related outbuildings detached from primary farm	848	0.22%
8128	Other grain farming (barley, rye, milo, oat, wild rice etc…)	747	0.20%
8124	Dry pea and bean farming	648	0.17%
8130	Polyculture/CSA (community supported agriculture)	396	0.10%
8190	Greenhouse, nursery and floriculture production (nursery stock, shrubbery, cut flowers, and other products produced primarily for non-food uses, such as landscaping)	380	0.10%
8147	Horses and other equine production	312	0.08%
8166	Other vegetable (except Potato) and melon farming	276	0.07%
8192	Certified Tree Farm- Sustainable Forestry	164	0.04%
8113	Large scale grain elevators, Co-op, Cooperative	119	0.03%
8160	Apple orchards	110	0.03%
8165	Non-citrus fruit and tree nut farming	103	0.03%
8139	Other field farming NEC	103	0.03%
8193	Agri-tourism, pumpkin patches, corn mazes, berry picking, petting zoos, etc.	102	0.03%
8299	Other agricultural related activities, NEC.	97	0.03%
8111	Abandoned/Unused farming structures	90	0.02%
8161	Strawberry farming	86	0.02%
8168	Grape vineyards	64	0.02%
8229	Other animal husbandry services, NEC.	58	0.02%
8144	Hog and pig farming	41	0.01%
8123	Oilseed (except Soybean) farming	37	0.01%
8181	Aquaculture - fish	35	0.01%
8170	Vegetable garden (plots less than [one / one-half acre])	31	0.01%
8131	Hops	30	0.01%
8150	Chicken egg production	26	0.01%
8145	Sheep farming	24	0.01%
8162	Berry (except strawberry) farming	24	0.01%
8291	Horticultural services.	19	0.00%
8163	Fruit and tree nut farming	13	0.00%

8114	Hoop house, greenhouses or other building used primarily for growing vegetables	10	0.00%
8146	Fur-bearing animal and rabbit production (Llama, Alpaca)	8	0.00%
8129	Tobacco farming	8	0.00%
8140	Cattle ranching and farming	7	0.00%
8143	Goat farming	5	0.00%
8149	All other animal production	3	0.00%
8126	Potato farming	2	0.00%
8153	Apiculture (raising bees)	2	0.00%
	TOTAL	**377,913**	**100.00%**

Table 2: Types of agricultural land uses, 2020

(3) Numbers and Size of Farms

Section 91.01(13), Wisconsin Statutes, defines a "farm" as "all land under common ownership that is primarily devoted to agricultural use." The 2020 Land Use Inventory identified 6,879 unique, private landowners in each community within Dane County who had more than 10 acres of land and more than 50% of their land in agricultural use.

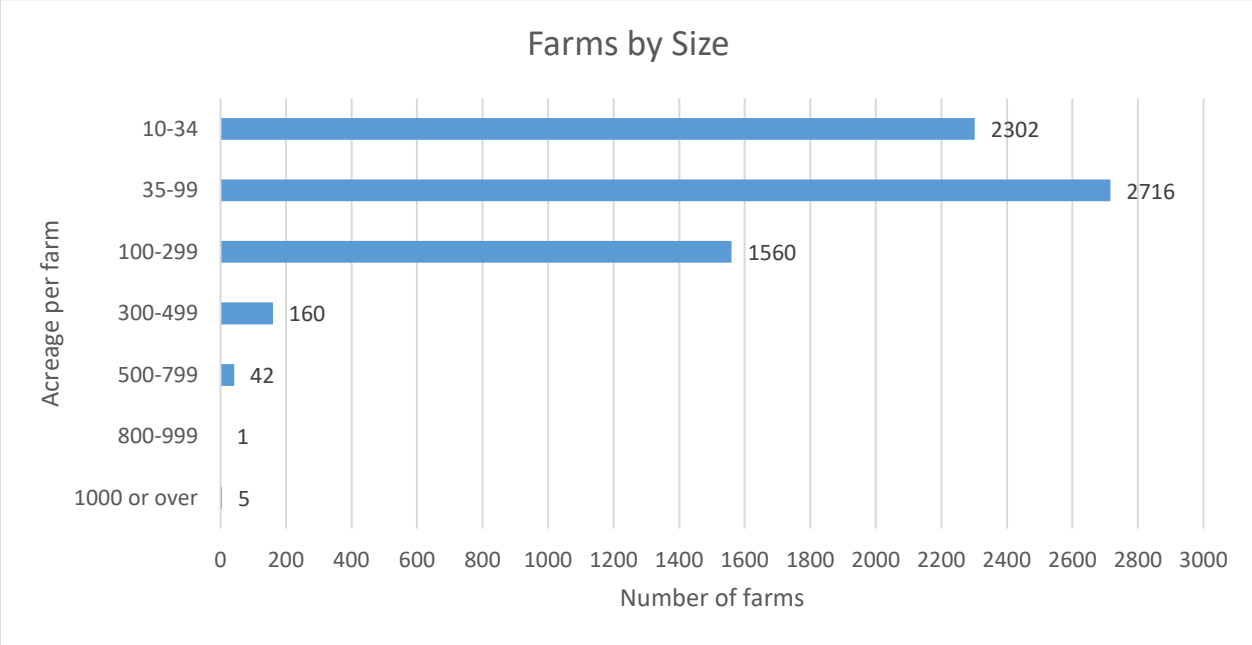

Figure 1: Number of farms by size, 2020[2]

[2] Dane County Planning and Development, *2020 Land Use Inventory*

2. Key Agricultural Resources

A. Land and Soil Resources

Land Evaluation (Map FPP-2) is a component of the Dane County Land Evaluation Site Assessment (LESA) system and rates the soil-based qualities of a site for agricultural use. The factors used to determine agricultural Land Evaluation were developed by the Natural Resources Conservation Service (NRCS) with cooperation from the Dane County Land Conservation Department. The ratings were based on information from Land Evaluation and Site Assessment: A Guidebook for Rating Agricultural Lands, Second Edition, published by the Soil and Water Conservation Society (1996).

Three factors were used to determine a numeric LE rating:

- prime farmland (10%)
- soil productivity for corn (45%)
- land capability class (45%)

The ratings were separated into one of eight agricultural groups (with arbitrary divisions) – with the soils in Group I as the best soils for agriculture, and Group VIII the poorest soils for agriculture.

B. Surface Water Resources

Four major river basins flow through Dane County: Lower Wisconsin; Grant-Platte-Sugar-Pecatonica; Upper Rock; and Lower Rock. Water conditions, challenges and trends differ from basin to basin, depending on the underlying landscape, proportion of urban, agricultural and natural land uses, and ground and surface water hydrology. Map FPP-3 shows Dane County's major water resources, while Map FPP-4 shows:

- Outstanding Resource Waters (ORW) Exceptional Resource Waters as determined by the Wisconsin Department of Natural Resources under NR 102, Wisconsin Administrative Code, and;
- Impaired Waters under s.303(d) of the federal Clean Water Act.

Significant issues common to most surface waters in Dane County include[3]:

- Agricultural nonpoint runoff, including cropland soil erosion and pollution from barnyard runoff;
- Urban nonpoint runoff related to replacement of permeable soils with impervious surfaces, and;

[3] Dane County Land and Water Resources Department, Healthy Farms Healthy Lakes Task Force Recommendations, 2017
Capital Area Regional Planning Commission, Dane County Water Quality Plan, 2005

- Nutrient (especially phosphorus) loading to surface waters.

C. Groundwater Resources

Two distinct groundwater sources supply nearly all of Dane County's domestic, commercial and industrial water demands. Shallow sandstone aquifers serve private domestic wells in rural areas, while the deep Mt. Simon aquifer serves municipal wells. Most groundwater in Dane County is replenished from precipitation falling within county boundaries. Groundwater also contributes to baseflow of many Dane County streams, and is an important input to wetlands and lakes as well.

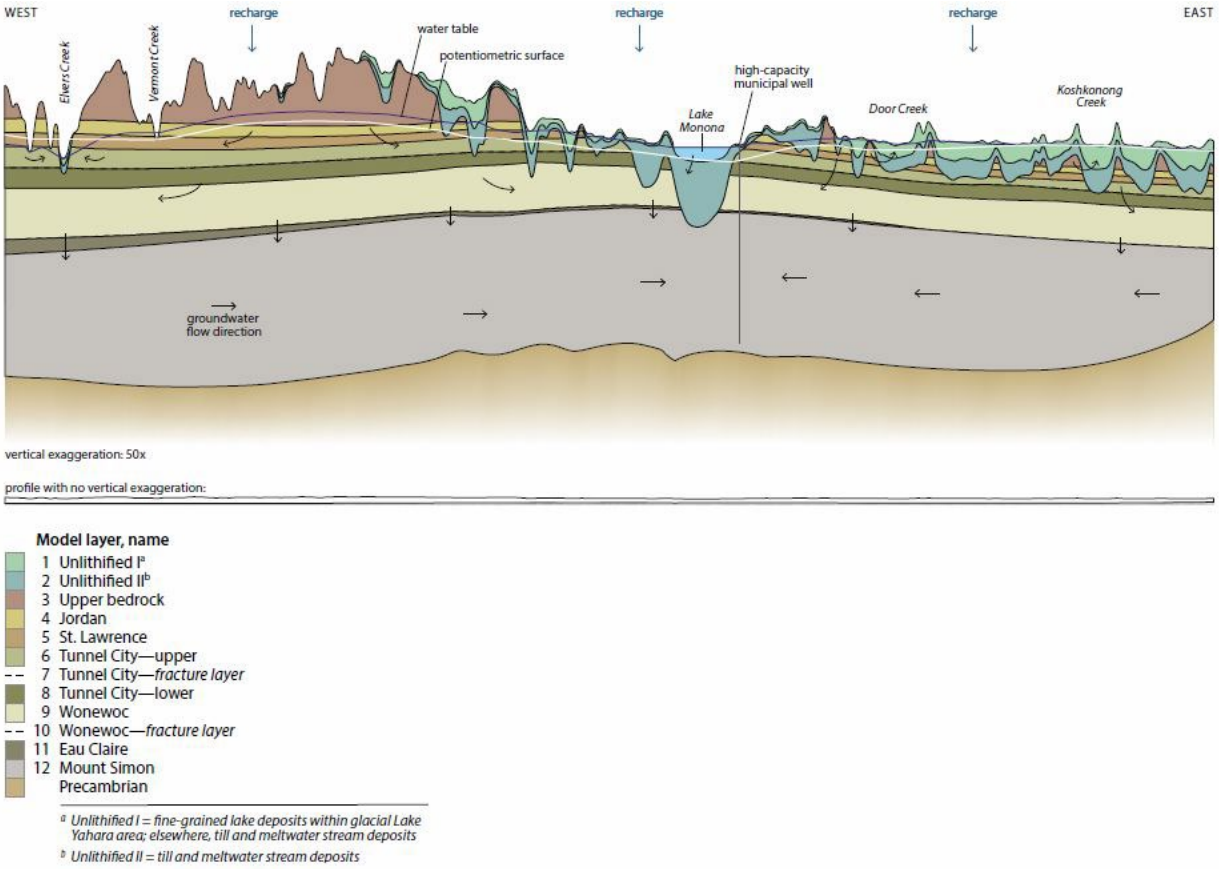

Figure 2: Subsurface profile of groundwater resources[4]

[4]Wisconsin Geological Natural History Survey

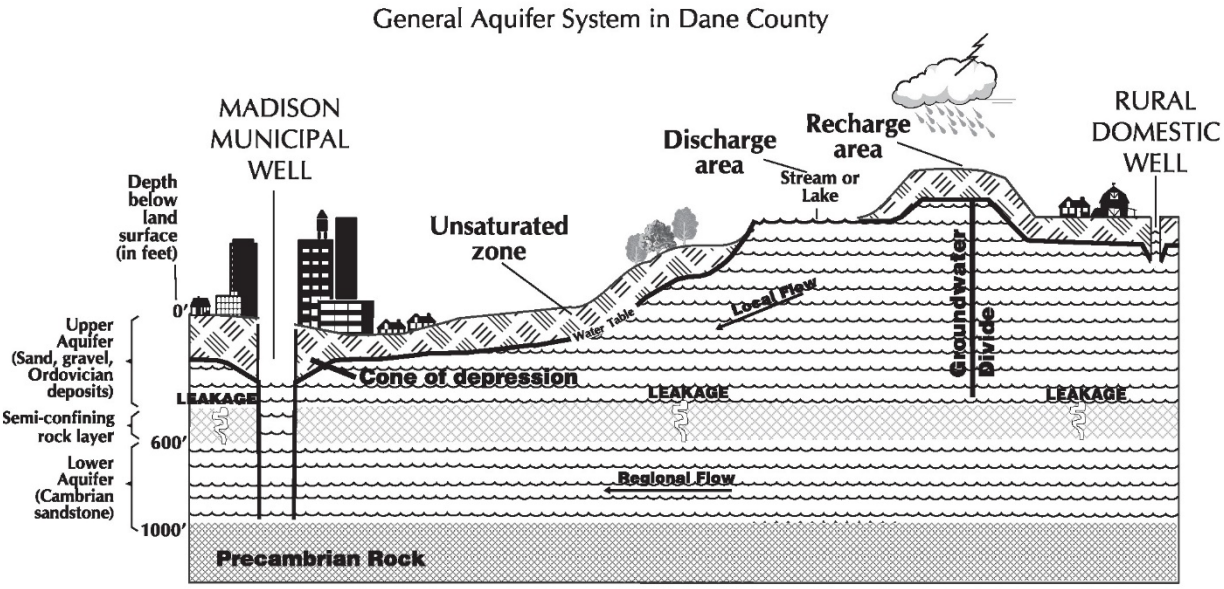

Figure 3: Schematic of Dane County aquifer system[5]

Pressures and concerns on Dane County groundwater include[6]:

- Lowering of groundwater tables due to high capacity well withdrawal;
- Municipal discharges, particularly redirection of groundwater to surface water as part of the wastewater treatment process;
- Nitrate/bacteriological contamination of private wells from over-fertilization and overconcentration of private onsite wastewater treatment systems, and;
- Residue pollutants resulting from historic land use practices.

[5] Capital Area Regional Planning Commission

[6] Capital Area Regional Planning Commission, Dane County Water Quality Plan, 2005

3. Infrastructure for Agriculture

Map FPP-5 shows the location of major agriculture-related facilities in Dane County. The 2020 Dane County Land Use Inventory identified 164 locations that provided equipment, supplies, processing, wholesaling, product storage or other services directly to the agricultural sector.

LUI code	Type	Count
Manufacturing and Processing		
2111	Meat packing - manufacturing	2
2870	Agricultural chemicals - manufacturing.	3
Wholesaling		
5146	Meat and Meat products - wholesale	4
5147	Fruits and vegetables (fresh) -wholesale	2
5182	Farm machinery and equipment - wholesale.	4
Farm-Related Retail		
5252	Farm equipment - retail.	15
5969	Other farm and garden supplies retail, NEC.	36
Financial Services		
6122	Agricultural, business and personal credit services (including credit unions).	19
Warehousing and Storage		
6371	Farm products warehousing and storage (excluding stockyards).	6
8113	Large scale grain elevators, Co-op, Cooperative	26
Veterinary and Animal Husbandry Services		
8221	Veterinarian services.	40
8222	Animal hospital services.	10
8229	Other animal husbandry services, NEC.	9
	TOTAL	176

Table 3: Agriculture-related uses, 2020[7]

A. Processing Facilities

(1) Food Processing

The 2020 Land Use Inventory identified 5 locations where meat packing and agricultural chemicals were manufactured on site. The total numbers for agricultural infrastructure locations are lower than 2010. This is because adjacent tax parcels involved in the same operation were counted separately in 2010 but were considered a single unit in 2020.

[7] Dane County Planning and Development, 2020 Land Use Inventory

(2) Community Manure Digester Project

In 2010, the Town of Vienna community manure digester began operation. Developed with funding from Dane County, the State of Wisconsin and private investors, this facility processes manure from three participating dairy farms. The digester reduces nutrient management costs for participating farmers who would otherwise have to landspread their manure. Each year, the digester keeps 68,000 pounds of phosphorus out of surface and ground water resources, while producing 2 megawatts of electricity, which is sold to Alliant Energy. By reducing land spreading of untreated manure, the project also significantly reduces nuisance odors and greenhouse gas emissions.

The second digester, located northwest of the City of Middleton, was commissioned in 2013 and collects manure from three nearby farms. Two farms use semi-trucks to transport manure to and from the facility while the third farm is located close enough to the facility to pump manure through a pipe. More than 26 million gallons of manure are processed at the facility each year using screw press and centrifuge technology, similar to the Waunakee community digester, to separate fiber and solids containing phosphorus,. This facility converts the methane gas generated on site directly into more than 2,000 kW of electricity.

This location also includes a 71,000 square foot building and turner for composting the separated solids and a 15 million gallon manure storage facility to store the separated liquids. These structures improve the ability to manage the end products of the digester and to buffer facility malfunctions. The facility is also designed to accommodate further treatment technology including nutrient concentration systems.[8]

B. Storage

Forty large scale storage structures were identified in the county, including commercial silos, agricultural warehouses and grain elevators. This number does not include single farm storage units.

C. Transportation

Map FPP-6 shows the location of roads, railroads and airports in Dane County.

[8] Dane County Land & Water Resources Department, "What We Do."

4. Capital, Institutional and Educational Support for Agriculture

A. Federal Government

(1) US Department of Agriculture

(a) Farm Services Agency

The Farm Services Agency (FSA) of the US Department of Agriculture administers a variety of financial and technical programs that provide assistance directly to farmers. The Wisconsin statewide FSA office is located on Excelsior Drive in Madison.

(b) Rural Development Agency (RDA)

The RDA offers loans, grants and loan guarantees to help create jobs and support economic development and essential services such as housing; health care; first responder services and equipment; and water, electric and communications infrastructure.

(c) Natural Resource Conservation Service

The Natural Resource Conservation Service (NRCS) administers a variety of conservation, cost-share, technical assistance and landscape planning related to conservation of soil, water and habitat.

The Agricultural Conservation Easement Program (ACEP) protects the agricultural viability and related conservation values of eligible land by limiting nonagricultural uses which negatively affect agricultural uses and conservation values, protect grazing uses and related conservation values by restoring or conserving eligible grazing land, and protecting and restoring and enhancing wetlands on eligible land. ACEP has two components:

- Agricultural Land Easements
- Wetland Reserve Easements

(d) Other USDA Resources

Additional USDA resources are available at https://www.farmers.gov.

B. State Government

(1) Department of Agriculture, Trade and Consumer Protection (DATCP)

DATCP partners with all the citizens of Wisconsin to grow the economy by promoting quality food, healthy plants and animals, sound use of land and water resources, and a fair marketplace. The agency's vision is to deliver efficient and effective programs and services to Wisconsin agriculture, consumers, and businesses, to provide market confidence and to enhance competitiveness and profitability. DATCP endeavors to promote sound use of land and water resources through programs like the following: Agricultural Impact Statements,

Conservation Engineering, Conservation Reserve Enhancement Program (CREP), support of drainage districts, Farmland Preservation and Agricultural Enterprise Areas, Livestock Facility Siting, Manure Storage Ordinances, Nutrient Management, Producer-led Watershed Protection grants and administration of the Soil and Water Resource Management Program which offers financial support to locally led conservation at the county level. In addition, the agency seeks to support agricultural development through the Wisconsin Farm Center, the Economic Development and Innovation Center, the International Agribusiness Center, Something Special from Wisconsin, Alice in Dairyland and the Fairs Program. The agency is charged with regulating food and recreational safety in the state which directly impacts meat, food and dairy producers, processors, distributors, retailers, and consumers. The agency's division of animal health implements a number of species specific programs that regulate a number of elements of the agriculture industry. [9]

(2) Wisconsin Department of Revenue

The Wisconsin Department of Revenue administers the Wisconsin Farmland Preservation Income Tax Credit program, based on eligibility criteria determined by DATCP, the Dane County Farmland Preservation Plan and conservation compliance with the Dane County Land and Water Resources Department.

C. University of Wisconsin – Madison

The University of Wisconsin - Madison College of Agriculture and Life Sciences currently operates 12 Agricultural Research Stations throughout the state, providing space for research to occur from various departments, such as Agronomy, Animal Sciences, Biological Systems Engineering, Dairy Science, Entomology, Forest Ecology and Management, Genetics, Horticulture, Plant Pathology, and Soil Science.

The Department of Planning and Landscape Architecture operates the Kaufman Food Lab, founded in 2014 by Department Chair Alfonso Morales. The Kaufman Food lab hosts various research projects, most of which occur within Farm2Facts, a farmers market toolkit developed by University of Wisconsin.

D. Dane County Government

(1) University of Wisconsin-Madison Extension Dane County

Under Chapter 59.87 of the Wisconsin Statutes, University of Wisconsin-Madison Extension Dane County serves as the official community outreach arm of the University of Wisconsin. Dane County Agriculture Agents provide agriculture research information to farmers and others to:

- Improve crops and soils management;

[9] Wisconsin Department of Agriculture, Trade and Consumer Protection

- Build management skills in dairy and livestock producers;
- Supply commercial and home horticulture information;
- Provide water quality and natural resources education, and;
- Improve farm financial management skills.[10]

(2) Dane County Land & Water Resources Department

Under the auspices of the Land and Water Resource Management Plan, the Dane County Land and Water Resource Department (LWRD) utilizes multiple programs to help implement soil and water conservation initiatives in Dane County. Many LWRD programs provide cost-share, grant or technical assistance directly to Dane County farmers. Significant funding sources for agricultural programs include[11]:

(a) Dane County Resources

- Dane County Land and Water Legacy Fund
- Community Manure Feasibility Study
- Yahara Clean (Capital Lakes Environmental Assessment and Needs)
- Dane County Conservation Fund

(b) State of Wisconsin Resources

- Lake Mendota Priority Watershed Project
- Land and Water Resource Management Cost-Share Program
- Targeted Runoff Management (TRM) Projects

(c) Federal Resources

- Conservation Security Program (CSP)
- Conservation Reserve (CRP) and Conservation Reserve Enhancement (CREP) programs
- Wetlands Reserve Program (WRP)
- Farm and Ranch Protection Program (FRPP)
- Environmental Quality Incentive Program (EQIP)
- Wildlife Habitat Incentives Program (WHIP)
- Technical Service Provider (TSP)

(3) Dane County Department of Planning and Development

The Dane County Department of Planning and Development includes three divisions.

[10] Dane County Extension
[11] Dane County Land and Water Resources Department, "Land and Water Management"

(a) Planning Division

The mission of the Planning Division is to prepare and implement plans, policies, and programs that enhance the quality of life for all Dane County residents. The division actively engages and assists Dane County residents, communities, the private sector, and decision makers in addressing short and long-range planning issues related to land use; transportation; farmland preservation; natural resource protection; community services; housing; public safety and welfare; and, economic development. Staff provide technical expertise, conduct research, and collaborate with public and private sector partners to facilitate a resilient, sustainable, diverse, inclusive, and equitable future for Dane County communities.

(b) Zoning Division

The Zoning and Plat Review Division is charged with protecting and promoting the public health, safety, and general welfare of Dane County by administering County Zoning Ordinances (including state-certified farmland preservation zoning ordinances), Sign Regulations, Shoreland Regulations, Floodplain Regulations, Mineral Extraction/Reclamation ordinances, Airport Height Regulations, Road Name/Addressing Ordinances, and Land Division Regulations in the unincorporated areas of Dane County. The Division reviews development activities within the unincorporated areas of Dane County through the administration of these chapters of the Dane County Code of Ordinances. Staff in the Zoning and Plat Review Division has contact with members of the public on a daily basis providing educational information, guidance, and enforcement of the various regulations.

(c) Records and Support Division

The Records and Support Division maintains the Real Estate Ownership Property List and Personal Property List for all of Dane County, except the City of Madison. The division also maintains the records of the Dane County Surveyor's Office, including the Public Land Survey System information on tie sheets, Plats of Survey completed by private land surveyors, and geodetic control information on Dane County.

(4) Dane County Food Council

The Dane County Food Council is a 9-member board appointed by the county executive and the county board chair. Under s. 15.255, Dane County Code, the Food Council explores issues and develops recommendations to create an economically, socially, and environmentally sustainable local food system for the Dane county region.

E. Farmer's Associations

Dane County is home to various farmer associations, in part due to its proximity to Wisconsin state governments offices. Examples include the Wisconsin Farm

Bureau, Wisconsin Farmers Union, and Family Farm Defenders, which have missions to enhance the lives of farmers and those in rural communities through policy advocacy, education, and civic engagement. These groups are often statewide, so elect district representatives to accurately represent the various states of agriculture across Wisconsin.

In addition, there are four producer-led watershed organizations operating within Dane County. These groups are eligible for demonstration grants from the Department of Agriculture, Trade and Consumer Protection.

F. Nonprofits

Similar to that of farmer associations, we find plenty of nonprofit organizations within the confines of Dane County. These associations work to expand the legacy, feasibility, and affordability of agriculture within Dane County. These groups serve as another form of advocacy, and forge connections between communities and agriculture through education, community supported agriculture, and engagement. Some key examples of these organizations within Dane County include Rooted, which connects Dane County youth with agriculture through urban farms, and farm visits. We also see nonprofits working on the other side of the field, with organizations such as REAP Food Group seek to connect consumers and policy makers with the farmers in their communities.

5. Key Agricultural Specialties

A. Economically Significant Commodities

Table 2 shows the market value of various Dane County crops compared to other counties in Wisconsin and to agricultural counties across the United States.

Values of Sales By Commodity Group	Market Value (in $ 1,000)	State Rank	US Rank	US Percentile
Milk and other dairy products from cows	$ 230,212	4	25	99
Grains, oilseeds, dry beans, and dry peas	$ 151,584	1	172	94
Cattle and calves	$ 79,037	2	170	94
Nursery, greenhouse, floriculture, and sod	$ 14,170	5	186	93
Hogs and pigs	$ 10,547	3	369	87
Other crops and hay	$ 8,141	8	314	90
Vegetables, melons, potatoes, and sweet potatoes	$ 7,705	13	255	91
Poultry and eggs	$ 2,143	23	694	77
Fruits, tree nuts, and berries	$ 1,578	16	367	87
Cut Christmas trees and short rotation woody crops	$ 980	5	42	97
Tobacco	$ 856	1	168	48
Horses, ponies, mules, burros, and donkeys	$ 777	3	257	91
Sheep, goats, and their products	$ 580	20	294	90
Other animals and other animal products	Undisclosed	23	0	0
Aquaculture	Undisclosed	10	0	0
Cotton and cottonseed	0	0	0	0
TOTAL ALL PRODUCTS	$ 508,310	1	97	97

Table 4: Economically significant crops, 2017[12]

B. Livestock

Table 6 shows the top livestock categories in Dane County in 2017, and how Dane County compares to other counties in Wisconsin and to agricultural counties across the United States value of various Dane County crops compared to other counties in Wisconsin and to agricultural counties across the country.

Item	Quantity

[12] National Agricultural Statistics Service, USDA, 2017 Agricultural Census

Cattle and calves	155,725
Layers	73,715
Hogs and pigs	32,717
Horses and Ponies	3,515
Sheep and lambs	3,125
Broilers and other meat-type chickens	2,117
Pullets	1,205
Goats	1,015
Turkeys	439

Table 5: Top livestock inventory items, 2017[13]

C. Specialty Crops

The U.S. Department of Agriculture defines "specialty crops" as "fruits and vegetables, tree nuts, dried fruits and horticulture and nursery crops, including floriculture."[14] Growers of specialty crops may be eligible for federal and state grant assistance, preferred ranking for Purchase of Agricultural Conservation Easement grants, and other benefits. Map FPP-7 shows the 2010 location of specialty crops in Dane County.

[13] National Agricultural Statistics Service, USDA, 2017 Agricultural Census
[14] US Department of Agriculture, "USDA Definition of Specialty Crops," 2004

III. Trends and Challenges

1. Climate Change

A. Recent Changes in Climate

As shown in Figure 3, Dane County is not immune to the effects of global climate change. According to the Wisconsin Institute for Climate Change Impacts, Dane County has seen a 20% increase in the levels of annual rainfall between the period of 1950-2018. In this same time period, Dane County has also seen an increase of 2 degrees in its Average Mean Temperature (TMEAN). Increased temperatures and rainfall has effects on crop production, animal performance, as well as soil erosion- directly affecting Dane County farming.

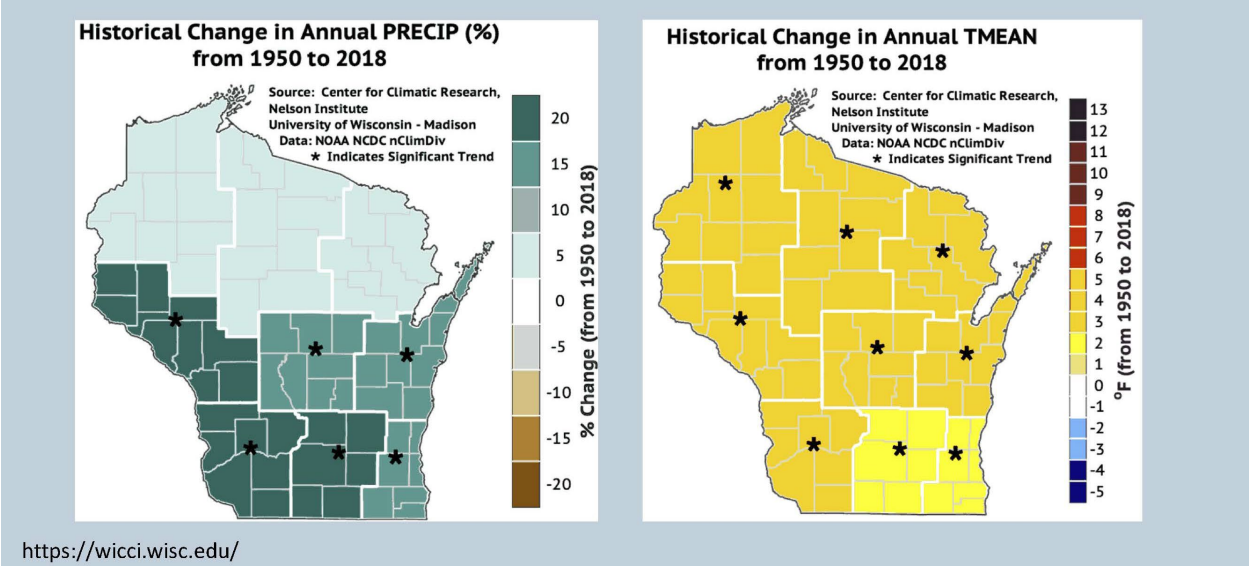

Figure 4: Historic climate change in Wisconsin, 1950-2018[15]

B. Projected Changes in Climate

Best available projections show that over the next 20-40 years, Dane County's overall climate will get warmer, (particularly in winter) and wetter (particularly in winter and spring).

[15] Wisconsin Institute on Climate Change Impacts

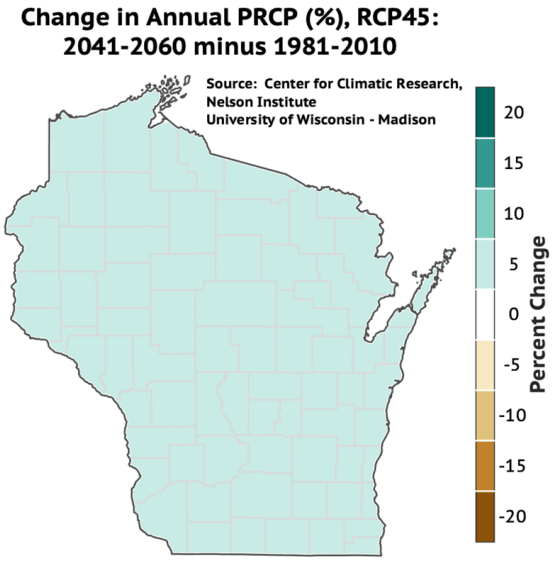

Figure 5: Proj. change in precip. 2041-2060

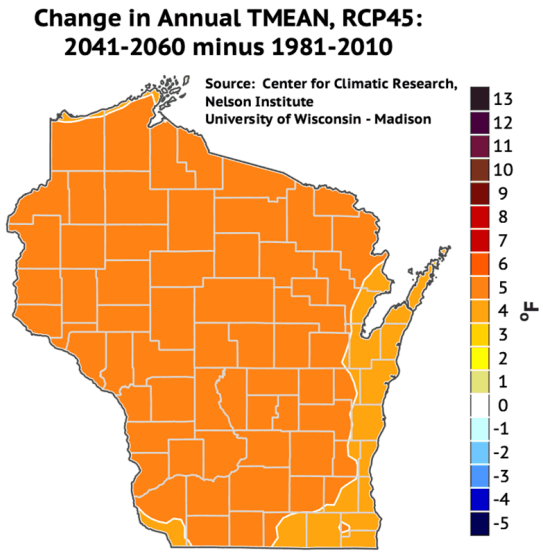

Figure 6: Proj. change in temp. 2041-2060

While projections suggest relatively moderate increases in *average* annual precipitation and *average* annual temperatures, models also indicate a more dramatic increase in both precipitation and temperature *extremes*. By 2060, Dane County can expect to see between 7 and 8 days per year with precipitation over 1 inch, compared with 6-7 days historically.

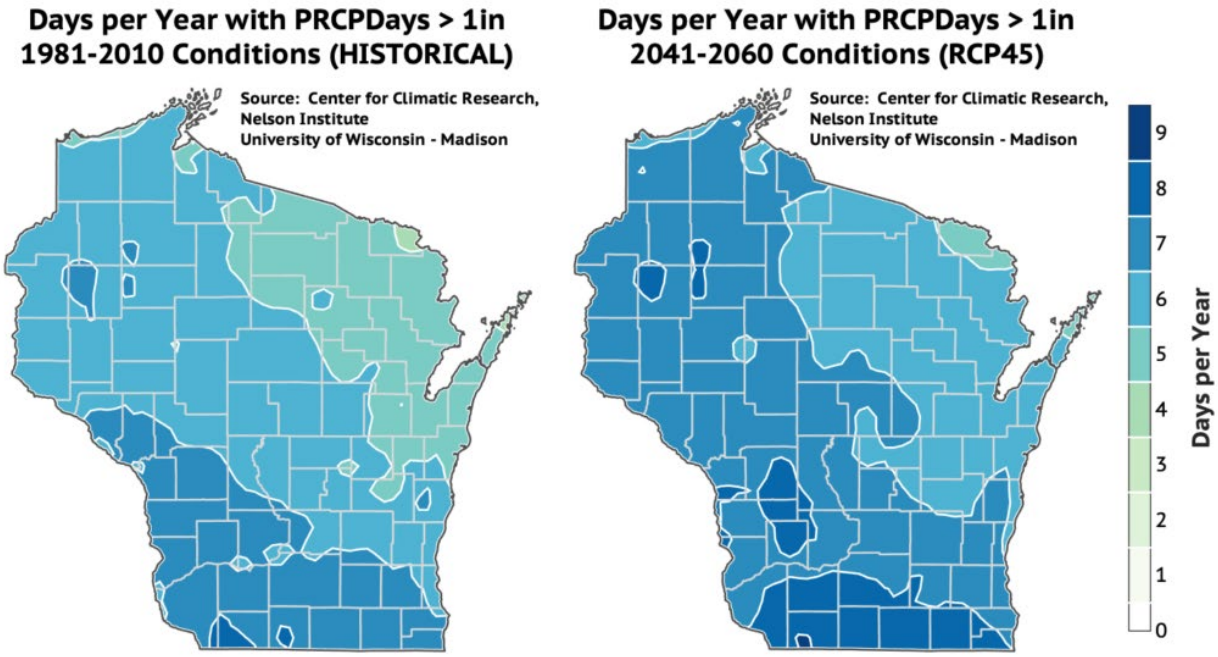

Figure 7: Proj. change in precip. over 1" per day 2041-2060

Extreme temperature events are also expected to increase. By 2060, Dane County can expect to see between 40 and 60 days per year with temperatures in excess of 90 degrees Fahrenheit, compared with historic averages of less than 20 days per year.[16]

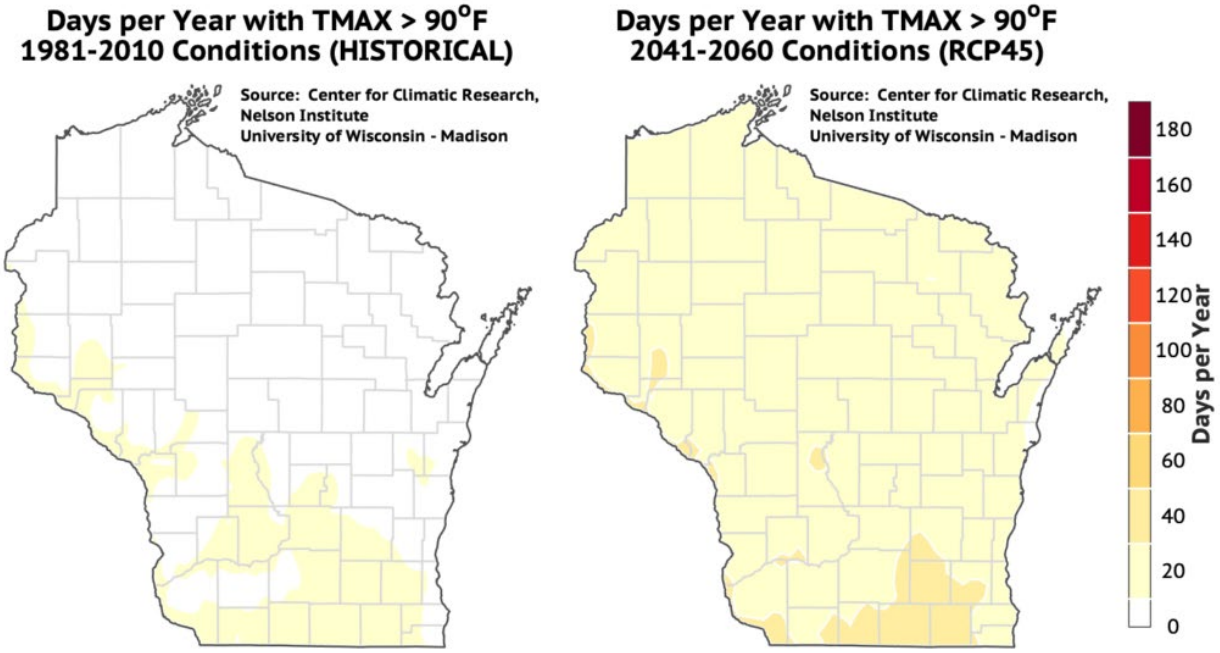

Figure 8: Proj. change in days over 90 degrees 2041-2060.

Future climate volatility poses significant challenges to farmers. More periods of heavy rainfall or snow melt will likely lead to more intense and more frequent flood events. On the other hand, increased number of very warm days coupled with relatively constant average summer rainfall may lead to increased risk of drought. Although longer growing seasons may benefit crop yields, wetter springs, more numerous and aggressive invasive species and increased risk of fungal infection may have negative impacts.

C. Agriculture's Impact on the Climate

Wisconsin's agricultural sector contributed 18.4 metric tons of CO_2 equivalent ($MtCO_2e$) in 2017, up from 16.1$MtCO_2e$ in 2005[17]. Agriculture accounted for 15% of the state's total greenhouse gas emissions in 2017.[18]

[16] Center for Climatic Research, University of Wisconsin-Madison Nelson Institute
[17] Wisconsin Institute on Climate Change Impacts, *Agricultural Working Group Report, 2021*
[18] Wisconsin Department of Natural Resources, 2020. *Wisconsin Greenhouse Gas Emissions Inventory Report*. Publication number AM-580-2020.

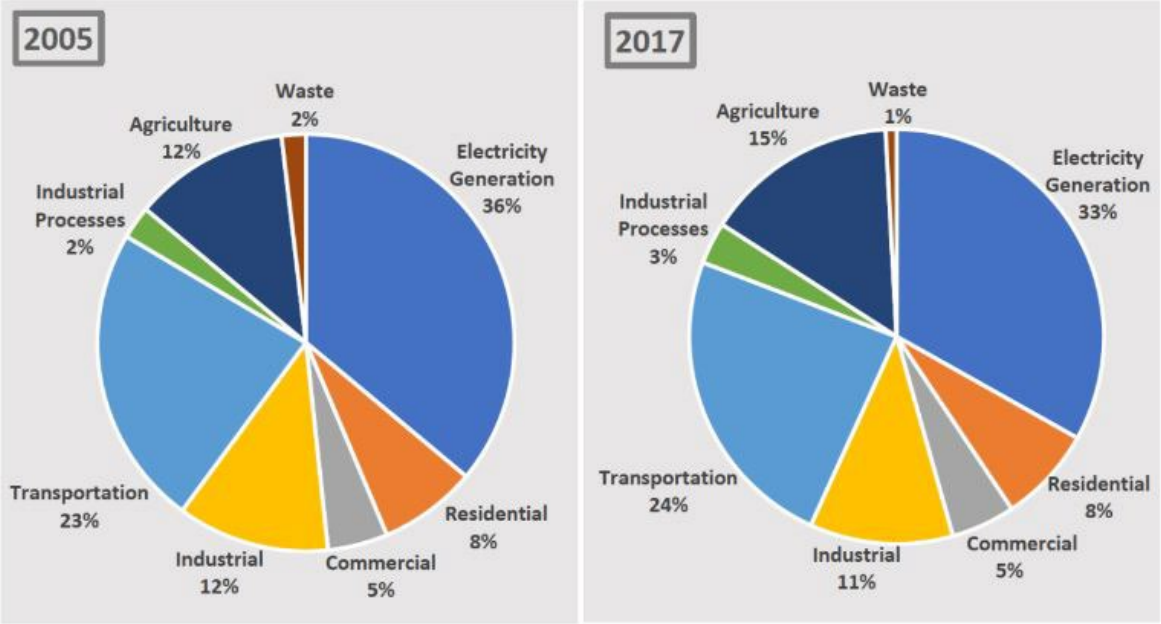

Figure 9: Wisconsin greenhouse gas emissions by sector 2005, 2017[19]

According to the U.S. Environmental Protection Agency, soil management activities, such as fertilizer application, accounted for 75% of the nation's nitrous oxide emissions in 2019. Ruminant digestion and manure management practices together contributed 36.6% of U.S. methane emissions. Among agricultural practices, dairy cattle were the most significant sector contributing to methane emissions.[20]

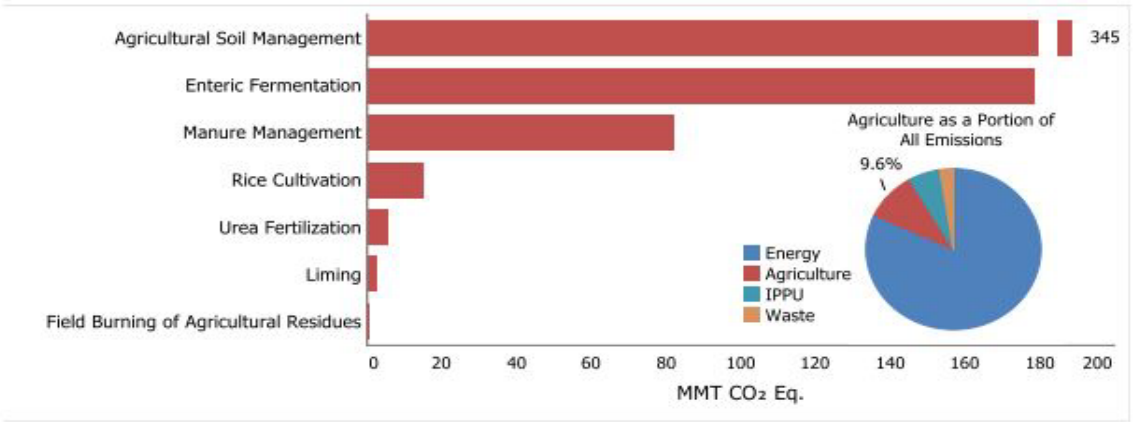

Figure 10: US greenhouse gas emissions by activity, 2019[21]

[19] Wisconsin Institute on Climate Change Impacts, *Agricultural Working Group Report, 2021*
[20] US Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019 - Agriculture*
[21] US Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019 - Agriculture*

Practices to mitigate agricultural greenhouse gas emissions include:

- Improving manure management, including increased use of manure digesters;
- Reducing use of nitrogen-based fertilizers
- Herd-size management, grazing and pasturing;
- Increased use of soil cover crops.

2. Population and Demographic Change

From 1980 to 2020, Dane County's growth rate increased each decade. Dane County's population grew by 13% during the 1980's, 16% through the 1990's, 14% during the 2000's and 10% during the 2010s. Between 2020 and 2030, Dane County's population is estimated to have grown to 606,653, a ten-year growth rate of 12.2%. Based on CARPC projections, Dane County's rate of growth is projected to gradually level off between 2020 and 2050 at an average growth rate of 10%, with a projected 2050 population of 738,253[22].

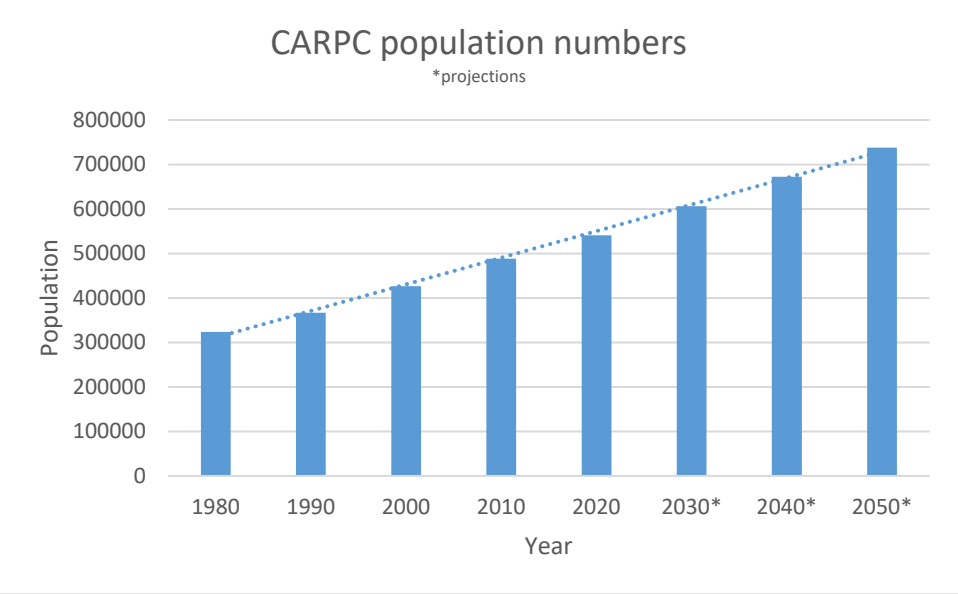

Figure 11: Dane County population growth 1980-2050

[22] Capital Area Regional Planning Commission

3. Farmland Preservation and Agricultural Development Trends, Plans and Needs

A. Land Use

In 2020, agriculture, open land, woodland, residential, infrastructure (including roads), water and recreational land uses accounted for 96.2% of the total area of Dane County. Figure 12 shows the changes in acres in these categories of land use between 2010 and 2020.

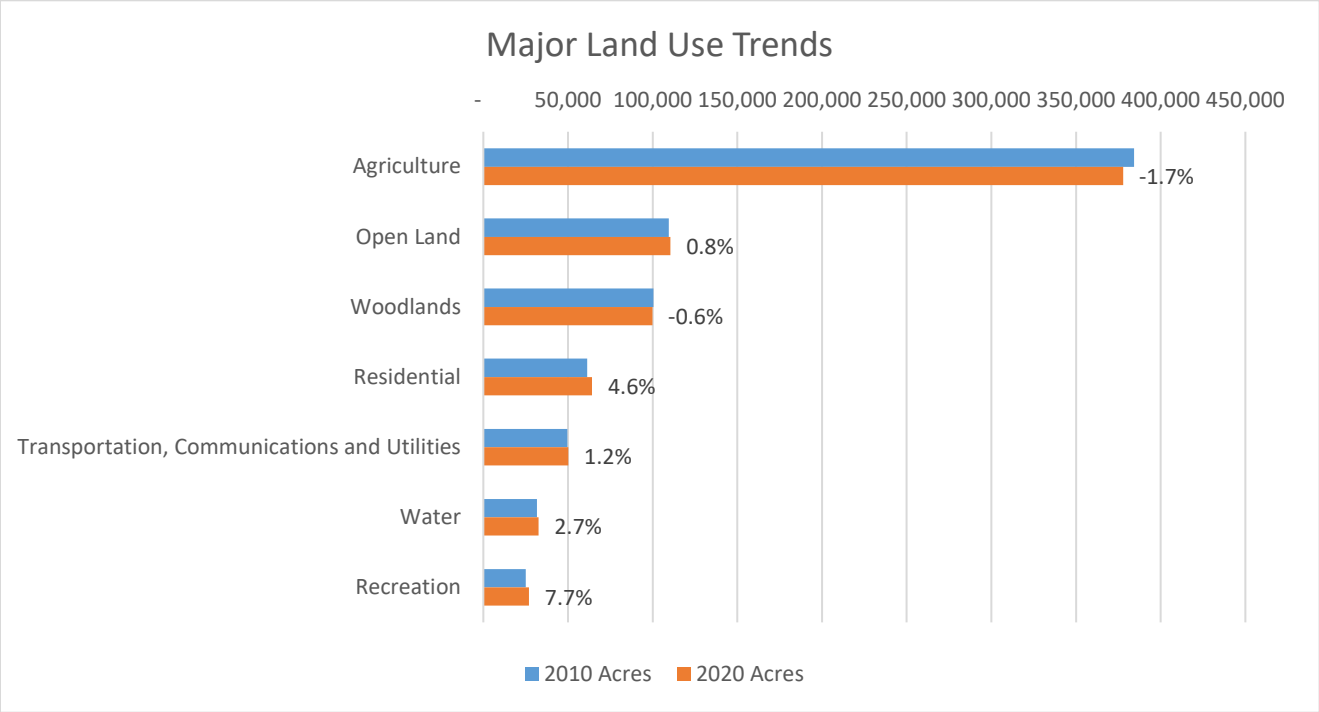

Figure 12: Major changes in land use 2010-2020[23]

(1) Conversion of Agricultural Lands to Other Uses

Agricultural lands declined by 1.7% (6,346 acres) between 2010 and 2020. During that decade, residential development grew by 4.6% (2,836 acres) and transportation, communications and utilities (including road right of way) grew by 1.2% (600 acres). Population growth in Dane County and continued strong demand for housing drive these trends, including conversion of agricultural lands for suburban and urban development.

Open lands (which include grasslands and reserve lands) also grew over the last decade (0.8% / 861 acres) but at a much lower rate than in previous decades. Between 1980 and 2000, many federal set-aside programs (such as CRP or CREP)

[23] Dane County Planning and Development *2020 Land Use Inventory, 2010 Land Use Inventory*

became popular for the first time, prompting many farmers to retire marginal lands. By 2010, however, many such lands had already been retired and the growth in acreage enrolled in such programs has leveled off.

Recreational and natural preserve land uses also saw strong expansion between 2010 and 2020, with over 1,900 acres added over the past decade. Dane County, the Wisconsin Department of Natural Resources, the U.S. Fish and Wildlife Service, the National Park Service and nonprofits such as Groundswell Conservancy and the Ice Age Trail Alliance have all invested heavily in land purchases over the past ten years.

Woodlands saw a decline of 0.6% between 2010 and 2020, likely due to the emergence of the Emerald Ash Borer in Dane County in 2012. Areas of open water also increased significantly, by 2.7%. Increased precipitation and higher groundwater levels due to climate change have contributed to this trend, as have artificial water features, created as amenities or stormwater controls for residential and urban development.

(2) Other Urban and Rural Land Use Trends

Although smaller in area, trends in other land use categories reflect Dane County's population and economic growth and the resulting competition for land.

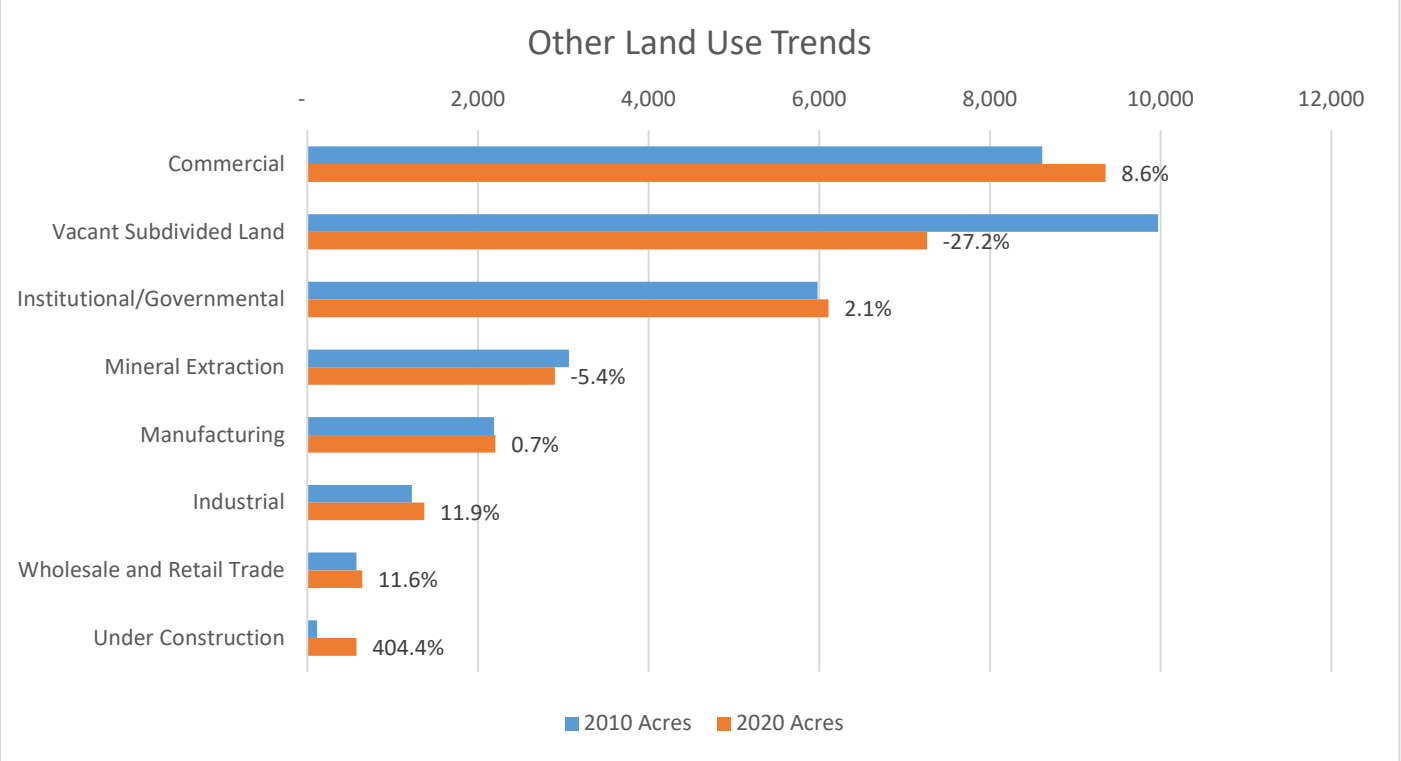

Figure 13: Other changes in land use 2010-2020

Commercial, institutional, manufacturing and trade land uses all expanded significantly between 2010 and 2020, an indicator of strong demand in the county

economy. Meanwhile vacant subdivided land declined by 27%, as lands left vacant after the 2008 financial crisis began to fill in after the real estate market recovered. The rebound in the county's real estate market is also seen in the jump in acres under construction in 2020.

Active mineral extraction operations, however, declined by approximately 150 acres over the last decade. This is likely an indicator of areas where resources have already been extracted and are either left idle or are reclaimed.

B. Agricultural Production

(1) Overall Trends

Across Wisconsin, the nature of farming has changed significantly over the past two decades, as farmers react to changing commodity prices, environmental considerations, new technologies and uses for agricultural products and shifts in market demand.

(2) Changes to Nature, Scope, Location, and Focus

(a) Farm Size

Dane County has seen a trend towards the consolidation of agricultural production to larger operations. There was an increase in farms larger than 500 acres while the others were in decline. In 2017, the average farm size in Dane County was 197 acres.[24]

(b) Yields

Crop yields continue to rise in amidst increasingly extreme weather across the last ten growing seasons. Corn yields have increased the most, by about 1.34 bu/ac/year. The number of dairy farms continue to decline, losing 22% between 2012 (304) and 2017 (237), while number of milking cows have risen slightly by about 2,000 (53,945) in the past decade.

(c) Geographic Distribution

Agricultural production continues to be heavily located in the outer townships of Dane County, with those farms located closest to the greater Madison area facing the greatest pressure from urban growth.

(d) Business Structure

Over 95% of all farms in Dane County are owned by individuals, families, family partnerships or family-based corporations[25]. Much of the farmland that is rented is owned by individuals that still reside in Dane County at

[24] National Agricultural Statistics Service, USDA, 2017 Agricultural Census
[25] National Agricultural Statistics Service, USDA, 2017 Agricultural Census

least part of if not all of the year, versus absentee landowners seen in other parts of the United States.

(e) Farm Income

Since 1969, Dane County farm income has generally trended upward, but has not kept pace with wages and salaries available from nonfarm employment. Between 2012 and 2017, net farm annual income rose from an average of $40,580 per farm to $42,704, an increase of 5.2 percent.[26] In contrast, median income for all Dane County households (including non-farmers) rose from $207,415 in 2012 to $223,031 in 2017, an increase of 7.5% over the 5-year span.[27] Farm income has shown increasing volatility from year to year, especially since 2008. Government payments spiked in 2020, largely a result of COVID-19 pandemic relief.[28]

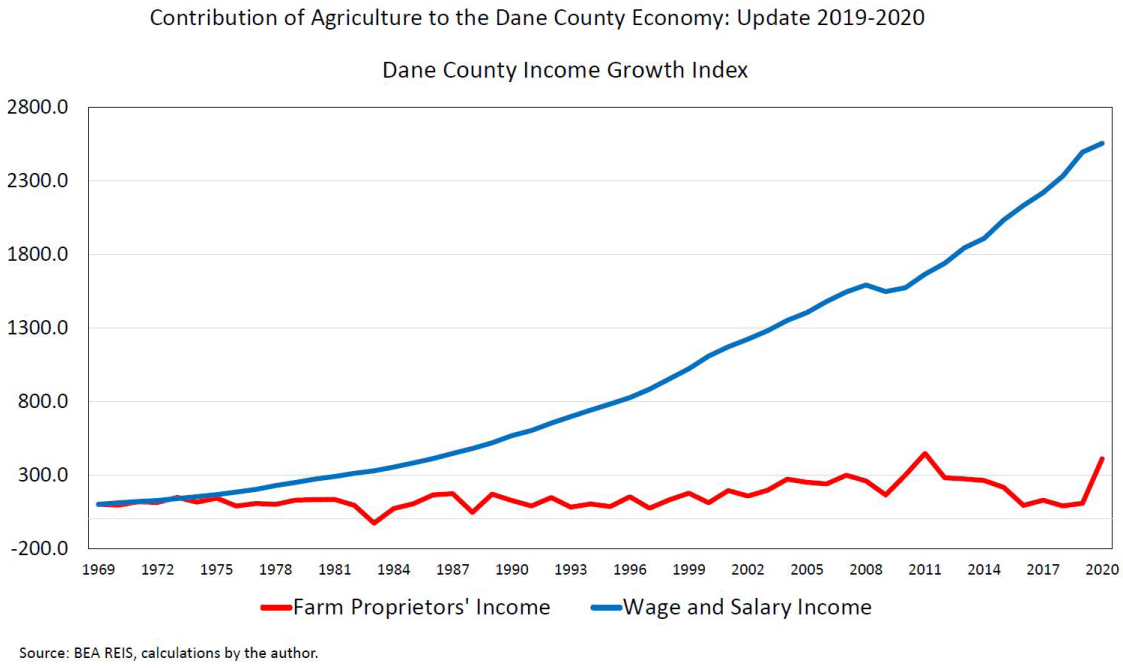

Figure 14: Farm income vs. wages 1969-2020[29]

(f) Products and Markets

Dairy production continues to dominate Dane County farming. Dairy cattle and milk sales generated over $250 million in total economic activity in

[26] National Agricultural Statistics Service, USDA, 2017 Agricultural Census
[27] U.S. Bureau of the Census, American Community Survey Estimates, 2012, 2017
[28] Steve Deller, UW College of Agriculture and Life Sciences, Contribution of Agriculture to the Dane County Economy: Update 2019-2020
[29] Steve Deller, UW College of Agriculture and Life Sciences, *Contribution of Agriculture to the Dane County Economy: Update 2019-2020*

2019, while grain operations, a little over $100 million, were a distant second in terms of sales value. Livestock and products continued to account for over 70% of total cash receipts for Dane County farms.[30]

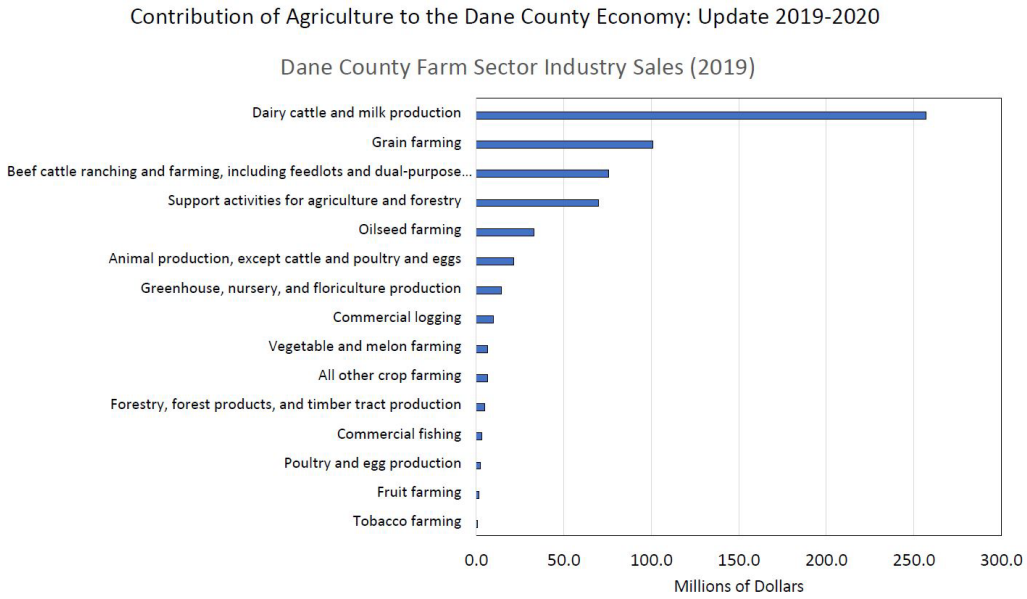

Figure 15: Sales by farm sector, 2019

Dane County has a growing market for small acreage production and direct sales of farm products, including road-side stands, farmers' markets, "pick your own" and Community Supported Agriculture. Traditionally based on sales to individual households, the market for locally grown produce has in recent years expanded to include restaurant, grocery and institutional buyers.

Finally, landscaping, nursery, greenhouse, floriculture and other horticulture products have performed very well in the past 5 to 10 years in Dane County. In 2017, horticultural and related products generated over $14 million in Dane County.[31]

(g) Manure Management

Environmental concerns, increasing land rents and conflicts with suburban and rural residential development have significantly affected manure management in Dane County.

[30] Steve Deller, UW College of Agriculture and Life Sciences, *Contribution of Agriculture to the Dane County Economy: Update 2019-2020*
[31] National Agricultural Statistics Service, USDA, 2017 Agricultural Census

Well-publicized fish kills resulting from agricultural runoff resulted in changes to the county's manure storage ordinance, to prohibit winter land spreading and strengthen storage design standards. Dane County has also made substantial investments in manure digester technology (see agricultural infrastructure below). Dane County is home to two community digesters - one in Waunakee and one in Middleton - that processed over 90 million gallons of manure and removed 168,000 pounds of phosphorus in 2021.

June of 2020 marked the completion of additional manure treatment and commissioning of Dane County's first Nutrient Concentration System at the Middleton community digester. In this system, the liquid fraction of the separated manure is pumped through ultrafiltration and reverse osmosis membranes, oxygenated and adjusted for pH, before being discharged to the North Fork of Pheasant Branch Creek. The system has the capacity to treat up to 100,000 gallons of manure each day while returning as much as 50,000 gallons of clean water back to the stream.

In addition to returning clean water to the environment, the system also reduces the volume and concentrates the nutrients within manure leading to:

- Cost efficiency in hauling manure longer distances to nutrient-deficient crop fields,
- Reduced equipment and truck traffic on local roads,
- Increased flexibility in the timing of nutrient applications as a result of increased storage capacity, and
- Customizable manure nutrient streams to meet a wider variety of cropping systems.

Over the past few years, Dane County has supported the efforts of Yahara Pride Farms and Endres Berryridge Farms to explore composting as a manure management tool. This includes supporting the purchase of a compost turner and compost spreader to be used in the Mendota Watershed.[32]

(h) Soil and Water Conservation

Over the past 25 years, Dane County farmers have reduced average annual soil erosion from their lands from 10.5 tons per acre per year in 1985 to 3.41 tons per acre per acre per year in 2007 (70% decline from 1985), to 1.46 t/ac/yr in 2016, (57% decline from 2007).[33] Farm conservation plans,

[32] Dane County Land and Water Resources Department, "Manure Management"
[33] Dane County Land and Water Resources Department, *Dane County Land and Water Resource Management Plan 2019-2028*

including installation of cost-shared conservation practices and trends toward no-till farming have contributed to soil erosion reductions.

Chapter 49 incorporates Wisconsin's state agricultural performance standards and prohibitions outlined in Chapter NR 151, Wisconsin Administrative Code. These are statewide standards that require all cropland and livestock operations meet to address water quality concerns. In some cases, cost-share assistance may be required to assist with the implementation of conservation practices to meet the performance standards and prohibitions.

(i) Agricultural Performance Standards:

- Sheet, rill and wind erosion: All cropped fields shall meet the tolerable (T) soil erosion rate established for that soil.
- Tillage setback: No tillage operations may be conducted within 5 feet of the top of the channel of surface waters.
- Phosphorus index: Croplands, pastures, and winter grazing areas shall average a phosphorus index of 6 or less over the accounting period and may not exceed a phosphorus index of 12 in any individual year within the accounting period.
- Manure storage facilities: All new, substantially altered, or abandoned manure storage facilities shall be constructed, maintained or closed in accordance with accepted standards. Failing and leaking existing facilities posing an imminent threat to public health or fish and aquatic life or violate groundwater standards shall be upgraded or replaced.
- Process wastewater handling: There may be no significant discharge of process wastewater to waters of the state.
- Clean water diversions: Runoff from agricultural buildings and fields shall be diverted away from contacting feedlots, manure storage areas and barnyards located within water quality management areas (300 feet from a stream or 1,000 feet from a lake or areas susceptible to groundwater contamination).
- Nutrient management: Agricultural operations applying nutrients to agricultural fields shall do so according to a nutrient management plan.

(ii) Manure Management Prohibitions:

- No overflow of manure storage facilities.
- No unconfined manure piles in a water quality management area.
- No direct runoff from feedlots or stored manure into state waters.

- No unlimited livestock access to waters of the state in locations where high concentrations of animals prevent the maintenance of adequate or self–sustaining vegetative cover.[34]

C. Enterprises Related To Agriculture

(1) Overall Trends

Farming, on-farm "value-added" processing and off-farm food processing industries contributed over:

- $3 billion in sales;
- 14,000 jobs;
- $1.1 billion in net income, and;
- $72 million in local, county and state tax revenue

to the Dane County economy in 2019[35].

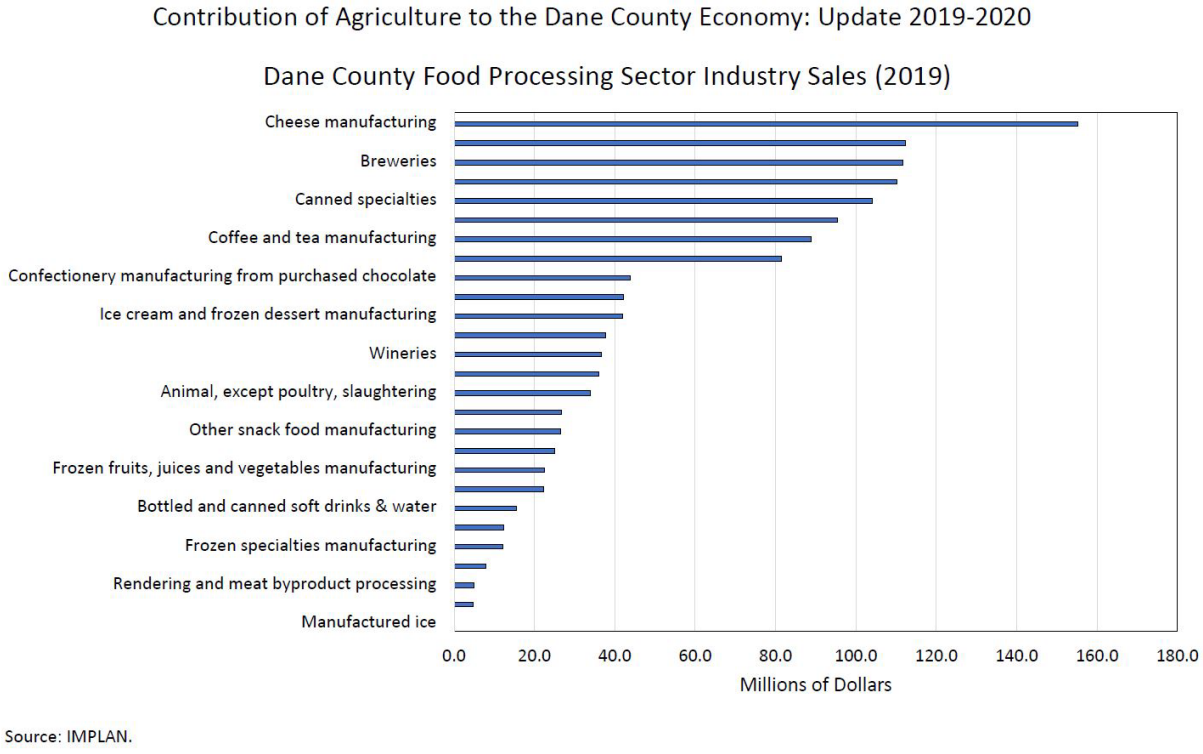

Figure 16: Food processing sales by sector, 2019

[34] Dane County Land and Water Resources Department, "Manure Management"

[35] Steve Deller, UW College of Agriculture and Life Sciences, *Contribution of Agriculture to the Dane County Economy: Update 2019-2020*

(2) Changes to Nature, Scope, Location, and Focus

According to IMPLAN data, the food processing sector in Dane County declined from $2.3 billion in total output in 2012 to less than $1.3 billion in 2019, a decline of 45%. The closure of Madison's Oscar Mayer plant in 2017 contributed to these losses. In contrast, Wisconsin's overall food processing output grew by 20% over the same period. While numbers of "local food" products have increased in Dane County, overall retail sales and employment remain relatively small.

4. Housing

Residential development competes for much of the same land base required by agriculture. The same soil, slope and drainage conditions that make for productive farmland also make for ideal building sites. Between 2000 and 2020, single family residential development accounted for more permanent conversion of Dane County agricultural land (11,104 acres) than any other land use.[36]

Housing construction in Dane County, following national real estate market trends, has shown considerable volatility in recent years. From 1982 to 2003, new housing construction in Dane County followed a generally upward trend. After peaking in 2003 with 5,466 new housing units, permits for new housing construction in Dane County declined, in some cases precipitously, each year until 2010 (1,060). The number grew again, peaking in 2016 with 4,470 new units and declining until 2019. There were 4,769 permits issued in 2020. [37]

[36] Dane County Planning and Development, 2020 Land Use Inventory
[37] Capital Area Regional Planning Commission

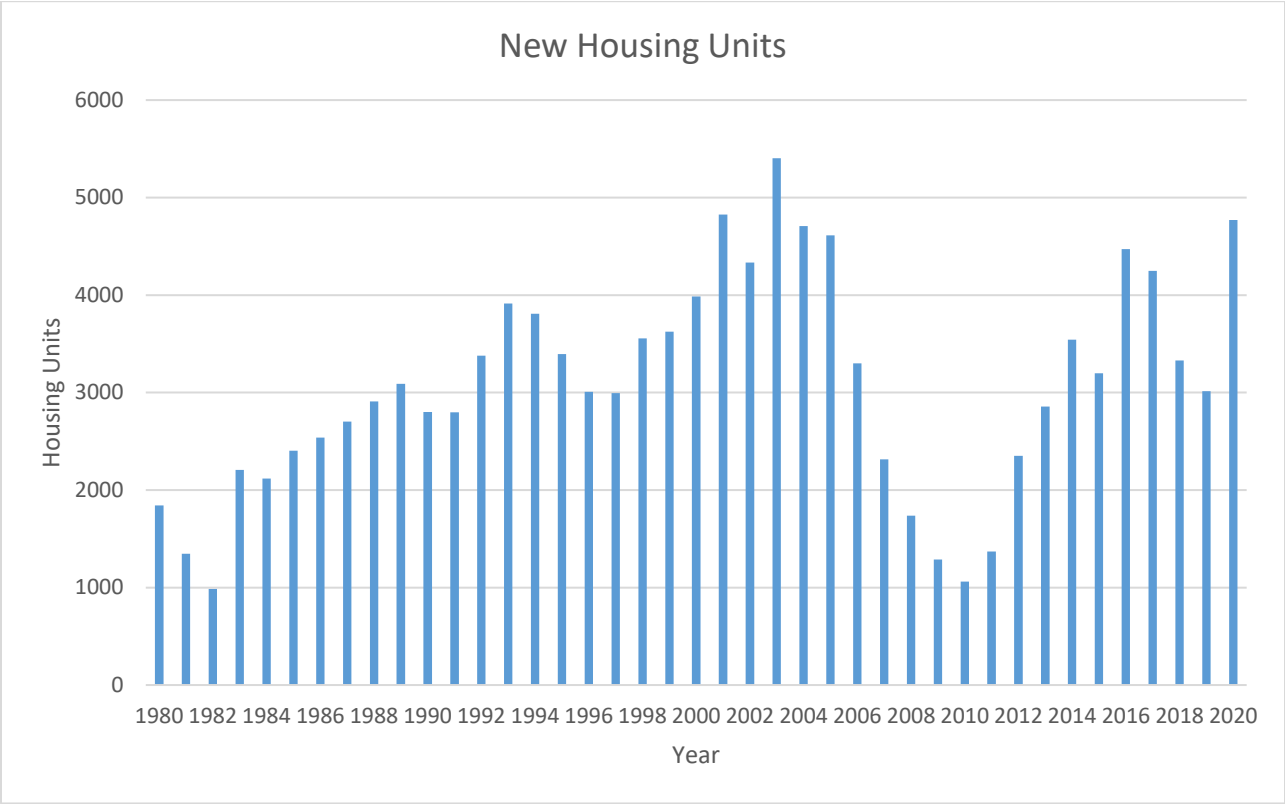

Figure 17: New housing units 1980-2020

5. Economic Growth and Business Development

As of June, 2022, Dane County had an estimated civilian labor force of 332,936. Dane County unemployment rates had fallen from 5.3% in the start of 2011 to 1.9% at the end of 2019. The unemployment rates started rising sharply in the beginning of the 2020, hitting a high of 10.6% in April, 2020. The unemployment rate then started declining, and was at 2.7% in June 2022. The average unemployment rate for the first have of 2022 was 2.3%.

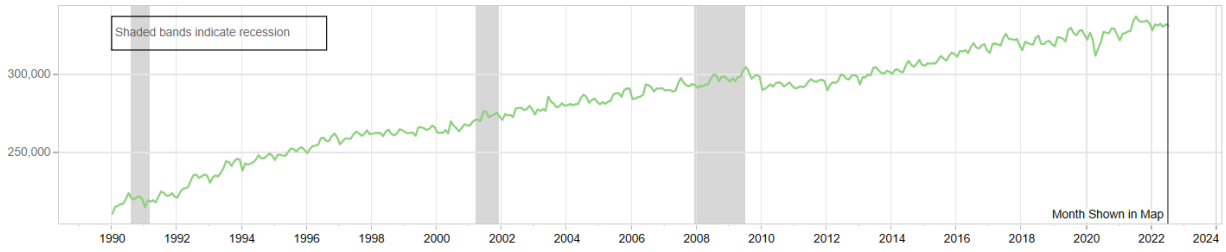

Figure 18: Labor force in Dane County 1990-2022

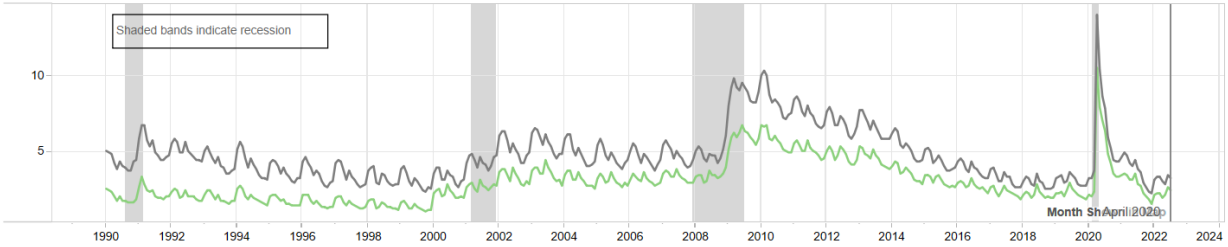

Figure 19: Unemployment rate in Dane County 1990-2022

Total jobs in Dane County in 2020 declined 4.13% from 2019, or 14,109 jobs. All Wisconsin counties experienced year-over-year total job declines amidst the COVID-19 pandemic, with Dane's percent change ranked 20th. Leisure and Hospitality decreased 26.91%, a net job loss of 9,289. Both the Accommodation and Food Services and the Arts, Entertainment, and Recreation sectors within the broader Leisure and Hospitality supersector declined over the year by more than 20%. Though accounting for a small share of employment, Accommodation and Performing Arts, Spectator Sports, and Related Industries both registered greater than 40% decreases.

Among supersectors, Other Services (-5.22%); Construction (-4.81%); and Trade, Transportation, and Utilities (-4.33%) decreased at the next highest percentages. Similar to Leisure and Hospitality, Other Services contains many high contact positions that became less tenable during the pandemic. All subsectors within Construction declined, while Trade, Transportation, and Utilities was mixed. The Couriers and Messengers subsector grew the fastest percentage (28.3%) across all industries with the increased demand for delivery services. Three supersectors within the county added jobs over the year, with Education and Health Services adding the most jobs (886) and Information growing at the fastest rate (1.90%). Education and Health Services is the largest supersector in the county, accounting for over a quarter of employment and total payroll. Though on net the supersector gained, Healthcare and Social Assistance increased by 4.5%, while Educational Services decreased by 3.8%.[38]

[38] Job Center of Wisconsin, "Dane County Profile" 2022

	2020 Average Monthly Employment	1-year Numeric Change	1-year Percent Change	Percent of Total Employment	Total Payroll	Percent of Total Payroll
Construction	15,704	-793	-4.81%	4.79%	$ 1,124,479,764	5.43%
Education & Health Services	89,191	886	1.00%	27.20%	$ 5,527,776,690	26.68%
Financial Activities	22,402	-322	-1.42%	6.83%	$ 1,912,708,499	9.23%
Information	16,803	314	1.90%	5.12%	$ 1,837,666,768	8.87%
Leisure & Hospitality	25,226	-9,289	-26.91%	7.69%	$ 505,191,897	2.44%
Manufacturing	24,534	-670	-2.66%	7.48%	$ 1,658,163,926	8.00%
Natural Resources & Mining	2,317	32	1.40%	0.71%	$ 122,544,447	0.59%
Other Services	10,555	-581	-5.22%	3.22%	$ 475,295,652	2.29%
Professional & Business Services	48,596	-1,045	-2.11%	14.82%	$ 3,748,914,290	18.09%
Public Administration	20,984	-302	-1.42%	6.40%	$ 1,387,732,010	6.70%
Trade, Transportation, Utilities	51,611	-2,338	-4.33%	15.74%	$ 2,422,009,108	11.69%
All Industries	**327,923**	**- 14,109**	**-4.13%**	**100.00%**	**$ 20,722,483,051**	**100.00%**

Source: WI DWD, Labor Market Information, QCEW 2020

Table 6: Sector-wide employment trends, 2020

Dane County's relatively strong economy and favorable labor market presents both opportunities and challenges to Dane County farmers. Proximity to a metropolitan area with a relatively high per capita income has allowed farmers in the region to take advantage of direct-to-market sales of fresh produce and on-farm processed food products. Short commute times and jobs with good pay allow farming households to supplement their income. Across Wisconsin, a majority of farmers continue to report that off-farm income makes up the majority of their household income, mirroring national trends.

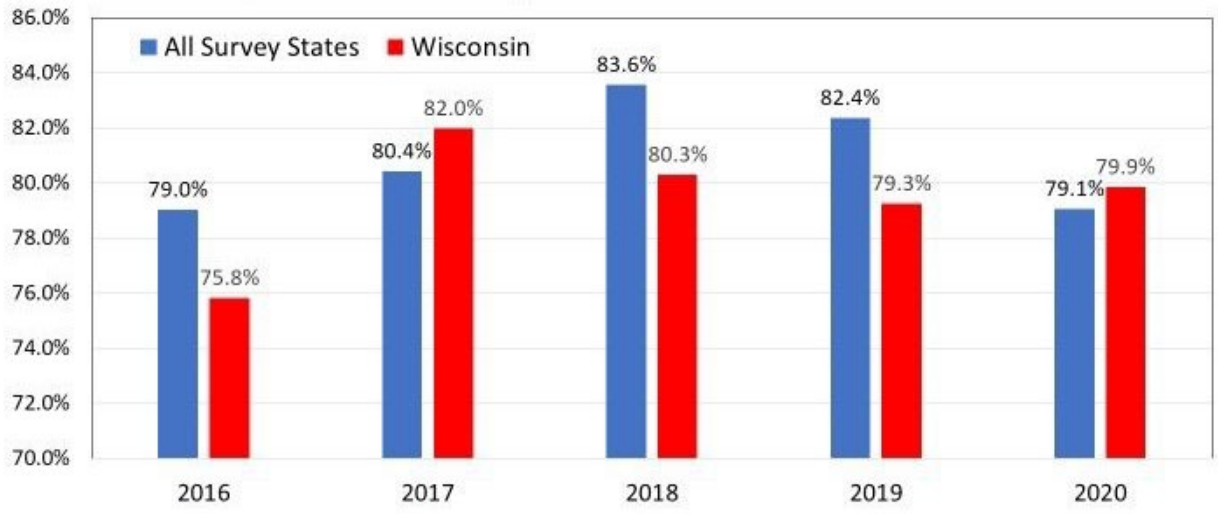

Figure 20: Off-farm income as percentage of total household income 2016-2020[39]

[39] Steve Deller, UW College of Agriculture and Life Sciences, *WIndicators Volume 5, Number 3: Farm Household Income*; USDA, Agricultural Resource Management Survey (ARMS)

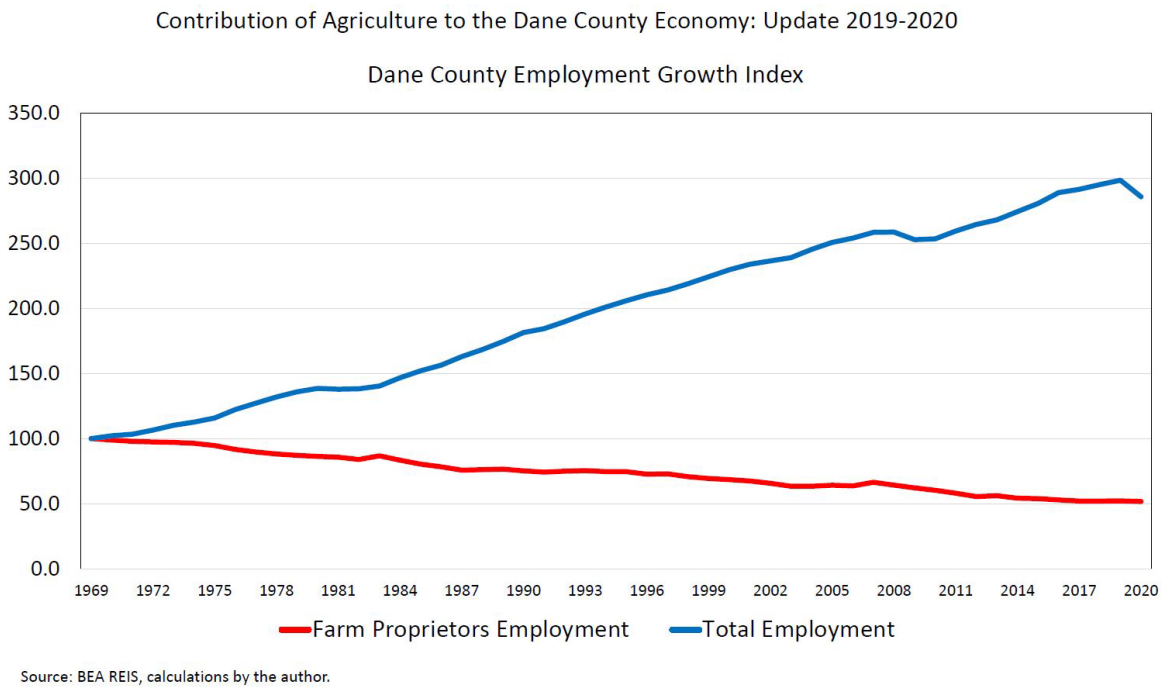

Figure 21: Dane County Employment Growth Index 1969-2020[40]

6. Municipal Expansion

Map FPP-9 shows the growth of Dane County incorporated municipalities between 1980 and 2022. Cities and villages in Dane County annexed a total of 26,987 acres between 2010 and 2022. Cities annexed over 6000 acres, as villages, which annexed about 21,000 acres[41]. The higher number for villages is because of the recent incorporation of the Village of Windsor. Cities will further add about 1000 acres in 2022, with the dissolution of the Town of Madison. While some annexed land remains under cultivation, typically, annexed land is intended for eventual development, except for relatively small percentages preserved as urban agriculture.

Much of this land will come from converting agricultural lands to urban uses. Moreover, half of Dane County townships with prime soils are located where growth pressure is the greatest, including the towns of Bristol, Burke, Middleton, Westport, and Windsor. Outlying service areas, such as the Northern USA, and the Sun Prairie, Verona and Cottage Grove urban service areas will likely see the greatest increase in land converted to developed uses. The Central Urban Service Area (CUSA), the region's most populous, will not be contributing to the majority of developed acreage

[40] Steve Deller, UW College of Agriculture and Life Sciences, *Contribution of Agriculture to the Dane County Economy: Update 2019-2020*
[41] Dane County Planning and Development

in the future due to boundary agreements, and more compact development practices.[42]

7. Transportation

A. Agriculture-Related Freight Shipments

Agricultural, agriculture-related, forestry and food products accounted for 5.6 million tons of freight traffic into, out of and within Dane County in 2017. Of that total, 1.9 million tons (35%) was shipped into Dane County from other locations, 3.5 million tons (63%) was shipped from Dane County to other locations, and 0.1 million tons (2%) was shipped entirely within Dane County.[43]

STCC	Commodity	Inbound Tons	Outbound Tons	Internal Tons	Total	Total %
01 13	Grain	571,499	1,570,977	11,367	2,153,843	38.38%
01 42	Dairy Farm Products	128,528	688,848	9,603	826,979	14.74%
20 42	Prepared or Canned Feed	103,835	408,141	12,382	524,358	9.34%
01 19	Misc. Field Crops	274,320	61,958	1,680	337,957	6.02%
28 71	Fertilizers	37,829	178,298	31,088	247,214	4.41%
01 14	Oil Kernels, Nuts or Seeds	30,281	163,127	495	193,903	3.46%
01 41	Livestock	120,109	43,038	906	164,053	2.92%
20 99	Misc. Food Preparations, NEC	98,600	14,513	4,152	117,265	2.09%
20 26	Processed Milk	103,964	389	494	104,847	1.87%
20 13	Meat Products	31,753	61,437	4,351	97,541	1.74%
24 11	Primary Forest Materials	76,480	5,469	462	82,412	1.47%
20 14	Animal By-products, inedible	21,037	55,108	3,756	79,901	1.42%
20 32	Canned Specialties	16,262	44,895	13,417	74,573	1.33%
20 39	Canned or Pres Food, Mixed	28,872	32,814	4,915	66,601	1.19%
20 33	Canned Fruits, vegetables, Etc.	53,344	7,841	1,550	62,735	1.12%
28 79	Misc. Agricultural Chemicals	8,380	48,997	3,043	60,420	1.08%
20 46	Wet Corn Milling or Milo		57,733		57,733	1.03%
01 39	Misc. Fresh Vegetables	42,648	6,233	526	49,407	0.88%
20 35	Pickled Fruits or Vegetables	34,909	8,830	2,212	45,951	0.82%
20 25	Cheese or Special Dairy Products	23,172	9,627	940	33,739	0.60%
20 11	Meat, Fresh or Chilled	33,459	78	84	33,621	0.60%

[42] Capital Area Regional Planning Commission
[43] Greater Madison Metropolitan Planning Organization, Wisconsin Department of Transportation

20 93	Nut or Veg Oils or By-products	28,768	20		28,788	0.51%
20 34	Dehydrated or Dried Fruit or Veg	11,634	12,092	2,787	26,514	0.47%
20 12	Meat, Fresh Frozen	24,857	26	75	24,958	0.44%
35 22	Farm Machinery or Equipment	7,371	7,102	402	14,875	0.27%
01 22	Deciduous Fruits	12,439	1,278	155	13,872	0.25%
01 33	Leafy Fresh Vegetables	9,831	2,814	303	12,949	0.23%
35 85	Refrigeration Machinery	10,235	549	657	11,441	0.20%
01 31	Bulbs, roots or Tubers	8,004	2,459	548	11,010	0.20%
20 84	Wine, brandy or Brandy Spirit	6,961	2,599	1,373	10,933	0.19%
20 44	Milled Rice, Flour or Meal	8,969	225		9,194	0.16%
01 34	Dry Ripe Vegetable Seeds	6,897	333		7,230	0.13%
01 29	Misc. Fresh Fruits or Tree Nuts	5,467	216	19	5,702	0.10%
01 52	Poultry Eggs	3,195	1,872	40	5,107	0.09%
01 92	Animal Specialties	417	3,915	61	4,393	0.08%
09 12	Fresh Fish or Whale Products	3,275	222	37	3,534	0.06%
22 81	Yarn	2,223	100	16	2,340	0.04%
35 51	Food Prod Machinery	591	1,143	165	1,899	0.03%
22 97	Wool or Mohair	699	62	12	773	0.01%
20	Food or Kindred Products	346	50		396	0.01%
01 91	Horticultural Specialties	211	158		369	0.01%
20 61	Sugar Mill Prod or By-prod		339		339	0.01%
28 61	Gum or Wood Chemicals	0	107		107	0.00%
20 1	Meat or Poultry, Fresh or Chilled	0	0		0	0.00%
	TOTALS	**1,991,671**	**3,506,033**	**114,071**	**5,611,775**	

Table 7: Primary agricultural products shipped, 2017

STCC	Commodity	Inbound Tons	Outbound Tons	Internal Tons	Total Tons	% Total
20 51	Bread or Other Bakery Prod	36,624	77,539	15,615	129,778	15.92%
40 24	Paper Waste or Scrap	12,442	101,355	4,289	118,086	14.49%
24 21	Lumber or Dimension Stock	81,700	2,361	477	84,537	10.37%
20 86	Soft Drinks or Mineral Water	74,256	1,338	1,169	76,763	9.42%
24 98	Wood Prod, NEC	66,962	7,604	2,095	76,661	9.40%
20 71	Candy or Other Confectionery	27,654	38,997	9,380	76,031	9.33%
26 51	Containers or Boxes, paper	64,456	138	216	64,810	7.95%

24 41	Wood Cont. or Box Shooks	52,672	1,183	1,260	55,115	6.76%
20 24	Ice Cream or Related Frozen Desserts	1,001	15,433	3,352	19,786	2.43%
24 39	Structural Wood Prod, NEC	16,474	1,835	348	18,656	2.29%
24 97	Wooden Ware or Flatware	12,779	4,019	1,666	18,464	2.26%
24 31	Millwork or Cabinetwork	13,756	3,567	1,079	18,402	2.26%
24 94	Cork Products	11,129	3,871	1,389	16,389	2.01%
24 34	Kitchen Cabinets, wood	10,498	1,439	691	12,628	1.55%
20 52	Biscuits, Crackers or Pretzels	7,733	2,553	1,305	11,591	1.42%
20 95	Roasted or Instant Coffee	5,544	2,456	703	8,703	1.07%
25 41	Wood Lockers, partitions, Etc.	2,258	1,559	808	4,625	0.57%
24 92	Rattan or Bamboo Ware	2,165	424	355	2,944	0.36%
35 53	Woodworking Machinery	454	416	65	935	0.11%
26	Pulp, paper or Allied Products	20	213		233	0.03%
24	Lumber or Wood Products	34	14		48	0.01%
		500,610	**268,313**	**46,264**	**815,187**	**100.00%**

Table 8: Secondary agricultural products shipped, 2017

B. Conflicts with Other Transportation Uses

Personal motor vehicles, including both single-occupancy and high-occupancy vehicles, accounted for 84% of all trips outside the central urban area in 2017.[44] Slow-moving farm machinery and fast moving automobiles must frequently share local and county roads, resulting in increased risk of traffic accidents. As travel patterns disperse, pressure on farmland increases as well. Adding lanes to existing roads not only directly consumes farmland through expanded rights-of-way, but can also create barriers to movement of farm machinery. New roads can effectively bisect existing farms, reducing their economic viability. In addition, residential or highway-oriented commercial development spurred by transportation improvements not only consumes additional farmland, but can create secondary conflicts with existing agricultural use.

8. Utilities

Approximately 10,065 developable acres have been added to Dane County urban service areas from 2010 through 2020. Over 60 million gallons per day (mgd) of groundwater is withdrawn and used for public and private water supply —about 140 gallons per person per day. Public water supplies account for about 75 percent of total groundwater use. Urban areas account for 80 percent of groundwater use.[45]

[44] Greater Madison Metropolitan Planning Organization, *Connect Greater Madison 2050 Regional Transportation Plan*

[45] Capital Area Regional Planning Commission, *Dane County Water Quality Plan*

9. Communications

A rapid rise in demand for and availability of cellular telephone technology has led to a commensurate increase in the number of towers and other antenna facilities for transmission and reception. To limit visual and other impacts of towers, Dane County has chosen to pursue a strategy of encouraging collocation of antenna arrays wherever possible.[46]

10. Community Facilities and Services

Dane County has undertaken a capital planning program for county operated community facilities, to meet the following goals:

- To meet obligations to maintain all existing facilities and equipment in good repair, address potential liability problems, and conform to Federal and State regulations;
- To respond to opportunities to achieve economies in operation through automation, energy efficiency, or other capital investments;
- To consider long-range financing strategies for major capital projects which balance capital needs, operational needs, and fiscal responsibility in a framework which supports priority-setting by policy-makers.
- To provide a basis for justifying and approving capital projects and then accountability for implementation.

The Capital Improvement Plan is updated and issued on an annual basis, and contains detailed recommendations for improvements, expansions, rehabilitation and maintenance of all county owned facilities.[47]

11. Energy

Energy consumption continues to increase in Dane County. A growing population and number of businesses account for a portion of this increase, and the rest is due to increased usage. Renewable energy continues to become economically more competitive with fossil-fuel energy generation. Dane County has seen growing interest in solar energy development in recent years, with several utility-scale installations complete or underway (Table 10). Demand for solar power facilities, particularly in the 10-100 megawatt range, is anticipated to grow over the next twenty years.

[46] Dane County Department of Planning and Development, Dane County Comprehensive Plan, Volume II, p. 57
[47] Dane County Department of Administration, Dane County Budget

Farm	Power (MW)	Size (acres)
Airport Solar	9	58
O'Brien	20	160
Morey Field (Middleton Airport)	5	
Koshkonong	300	2,349
Yahara Solar*	17	90
MGE-Madison-Madison School District*	8	53
**Under construction in 2022*		

Table 9: Solar facilities in Dane County, 2022[48]

12. Waste Management

The Department of Waste and Renewables is responsible for the management and operation of Dane County's landfills, renewable natural gas (RNG) facilities, Clean Sweep, construction and demolition (C&D) recycling facility and various other recycling programs. Their mission is to provide environmentally-sound and sustainable waste management and renewable energy solutions for current Dane County residents and future generations. This includes looking at waste as a resource to create renewable fuels and the conservation of landfill air space through waste diversion, recycling, and efficient operations.

With less than 10 years of landfill space remaining at Dane County's Rodefeld Landfill located at 7102 US Hwy 12/18 Madison, WI 53718, the community has an opportunity to plan for a changing waste stream and purposefully set the foundation to advance Dane County towards a circular economy.

The Department's vision for the next landfill site includes development of a sustainable business park or "Sustainability Campus" to divert waste and create local circular economies. This will be accomplished by attracting reuse, repair, and recycling businesses; new waste management technologies; and research. The intent is to design the site for safe public access, education, and recreation where visitors can examine their relationship with waste and the Dane County community can move towards a future where waste is not a liability, but a resource and an opportunity. The City of Madison and Dane County have formally agreed to take the next steps toward utilizing a portion of the Yahara Hills Golf Course property, which is across the road from the current landfill site, for this project. [49]

13. Environmental Preservation

The Dane County Parks & Open Space Plan (POSP) seeks to identify significant cultural, historical, and natural resources that should be considered for possible protection, preservation or restoration. The POSP also seeks to identify

[48] Dane County Office of Energy and Climate Change
[49] Dane County Department of Waste and Renewables

countywide recreation needs and Dane County's role in providing facilities to meet anticipated demands.

The POSP recognizes the value of farmland and actively seeks ways to incorporate farmland preservation and agricultural enterprise into plan recommendations. Many of these recommendations will help meet the goals of the Farmland Preservation Plan. For example, conservation easements on active farms surrounding county parkland will help preserve the agricultural use of the land while also preserving the park viewshed and rural atmosphere. Another example is the use of county parkland for community gardening and related enterprises, such as incubator space for beginning farmers. To the extent possible and reasonable, implementation of the Dane County Parks & Open Space Plan shall seek to complement the goals of the Farmland Preservation Plan. Map FPP-10 shows the major land resources in Dane County.[50]

[50] Dane County Land & Water Resources Department, *Parks & Open Space Plan 2018-2023*

IV. Index of tables of figures

V. Additional Resources

- *Climate Impacts on Agriculture* (Christina Anderson, Wisconsin Land & Water, 2022)
- *Contribution of Agriculture to the Dane County Economy: Update 2019-2020* (Steve Deller, UW-Madison College of Agriculture and Life Sciences, 2022)
- *Planning for Utility-Scale Solar Energy Facilities*, (Darren Coffey, American Planning Association, PAS Memo September/October 2019)