



A G E N D A

Town of Chino Valley
Planning & Zoning Commission
General Work Session

April 2, 2024



Town of Chino Valley General Work Session PLANNING & ZONING COMMISSION

Chino Valley Town Hall
202 N. State Route 89
April 2, 2024, 6:00 p.m.

The General Work Session of the Planning and Zoning Commission will meet to:

- Discuss the following items:
 - TA-2024-02 – Continued discussion regarding potential changes for the regulation of non-domestic animals
 - General Plan implementation
 - Dark Sky Ordinance

Dated this 20th day of March, 2024.

By: Laurie Lineberry, Development Services Director

A copy of the agenda and background material provided to the Commissioners is available for public inspection at the Marion Lassa/Chino Valley Library, 1020 W. Palomino Road, Chino Valley, Arizona. Further details may be obtained by contacting Development Services Department at 1982 Voss, Chino Valley, Arizona (928) 636-4427. The Town endeavors to make all public meetings accessible to persons with disabilities. With 72 hours advance notice, special assistance can also be provided for sight and/or hearing impaired persons at public meetings. Please call 636-2646 (voice) or use 711 (Telecommunications Arizona Relay Service) to request accommodation to participate in this meeting.

CERTIFICATION OF POSTING

The undersigned hereby certifies that a copy of this notice was duly posted at Town Hall, Chino Valley Post Office and the Chino Valley Library in accordance with the statement filed by the Town Council with the Town Clerk.

Date & Time: _____

By: _____

C.1 - TA-2024-02 – Continued discussion regarding potential changes for the regulation of non-domestic animals

Horse dry lots and shelters

Quick facts

- Dry lots are fenced areas that are bare of grass and key to rotational grazing systems.
- Dry lots should provide shelter, water, feed and at least 400 square feet per horse.
- High-traffic pads can help control mud prone areas in a dry lot.
- Always enclose dry lots with permanent fencing and place gates to allow access to nearby pastures.
- Remove manure from dry lots regularly.

Benefits of dry lots

Dry lots play a key role in rotational grazing systems. They are an area for providing shelter, hay, feed, water and access to adjacent paddocks and pastures.

- Dry lots are an area to house horses when pastures need rest such as when most of the pasture has been grazed to 3 to 4 inches or during the winter when pasture is no longer growing.
- Dry lots also provide space and turnout for horses with metabolic syndrome that cannot safely graze pasture due to the potentially high nonstructural carbohydrate content of grass.

Horses only turned out to dry lot will need hay to make sure they reach their dietary needs. On a dry matter basis, most horses commonly consume around 2 percent of their body weight in forage per day.

Where should you place your dry lot?

Here are a few standard guidelines for dry lot layout:

- Plan ahead for how you want to use your dry lot. If you want to rotationally graze, ensure that all pastures are adjacent to the dry lot and can be accessed through gates and/or laneways.
- Install systems for managing precipitation such as gutters, swales and rain barrels. Managing water flow will help you manage mud.
- **Install high-traffic pads** to help promote drainage in areas prone to mud build-up such as near gates, along laneways, and around shelters, feeders and drinking water sources.
- Plan for at least 400 square feet per average sized, 1,100-pound horse. This space does not include space required for shelters, feeders or water sources and assumes multiple horses housed together get along.

- Make sure that horses can easily move within the dry lot and have access to shelters, feeders and water sources. If horses do not get along, you may need to provide more space. If horses are larger than average, scale up in size.
- Shelters should be three-sided, placed to block winds, and allow for all horses to have access in poor weather conditions. Recommendations for size vary, but a general guideline is 72 to 144 square feet per averaged sized horse, assuming all horses in the herd get along. If horses do not get along or are larger in size, you may need to provide more space.
- Make sure your dry lot is not too big. This will help you easily maintain a weed-free space for your horses.

Selecting fencing and placing gates

- Always use a permanent, sturdy fencing to enclose a dry lot. Fencing options include:
 - Three- or four-board, wood fence
 - No-climb wire mesh fencing
 - Corral panels
 - Permanent electric fencing
 - Or a combination of these fence types
- Fencing should be easy to see. If you use electric fencing make sure it is constantly electrified.
- When possible use rounded corners to help avoid areas horses can become trapped.
- Place gates in corners and make sure they are large enough to allow access by large farm equipment. We recommend 16-foot gates for these passages.
- Consider including a 4-foot gate for easy access to the dry lot for people or a single horse. This can be useful when trying to enter the dry lot with a wheel barrow or other management supplies.
- Hang gates depending on how you would like them to swing and pick appropriate hardware for latching.
 - Gates hung in line with the fence can swing both directions but will create a space behind the gate. This space can be a hazard if a horse were to get caught behind it if left open for paddock access from the dry lot.
 - Gates hung parallel to the fence line on the outside of the post, sometimes called a “slam gate”, will only swing one direction but will reach the fence line when swung out. When installing a slam gate, make sure that the gate opens into the enclosure and when shut, rests against the latching post. This ensures that the gate will stay closed if a horse were to lean against it and break the latch.



Dry lot with a gate located in the corner

Maintaining your dry lot

- Remove manure regularly, ideally daily. Remember to follow local and state laws on proper manure handling and storage.

- Control weeds through regular mowing, clipping or herbicide applications. However, a correctly sized dry lot should not become weedy.
- Dragging may be necessary to maintain a level surface.



Dry lot after removing manure and dragging to level surface

Author: Aubrey Jaqueth, post-doctoral associate, College of Food, Agriculture and Natural Resource Sciences; Krishona Martinson, Extension equine specialist

Reviewed in 2024

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Please scan the above QR code to visit the live webpage for links.

<https://extension.umn.edu/horse-pastures-and-facilities/horse-dry-lots-and-shelters>

Housing and Space Guidelines for Livestock

As New Hampshire becomes more urban, the potential for conflict between the farming and non-farming communities increases. By using best management practices*, farmers can greatly reduce or eliminate problems arising from odors and flies, pesticide drift, contamination of surface and ground waters, and damage to neighboring crops. Following best management practices can help eliminate problems that arise between farming activities and other land uses in urban environments.

Farming activities may involve full-time, part-time or backyard farmers. Existing commercial farms, as defined by RSA 21:34-a, are protected by the Right to Farm Law; RSA chapter 432. This allows for properly managed agricultural enterprises to continue operating in residential areas.

Housing

Farm animals need some kind of shelter to escape the elements. It is commonly thought that winter is the most important time to provide shelter, but an animal's natural coat can allow them to tolerate much colder temperatures than people can. Summer heat can be harder on animals than winter if shade is not available to them, either by trees or structures if they are out on pasture. Similarly, lack of ventilation in a barn or building can also be detrimental to animal health. Many livestock animals like pigs and rabbits do not sweat, which increases the risk of heat stroke and decreases overall production.

A simple, three-sided shelter with an open front will meet the needs of many farm animals on pasture and is often the building of choice to raise healthy livestock. When designing a three-sided animal shelter, make sure the open side faces south, away from prevailing winds. Locate the structure on an elevated, well-drained site and keep winter access in mind for feeding and water handling.



Fast Facts

Farming activities may involve full-time, part-time or backyard farmers.

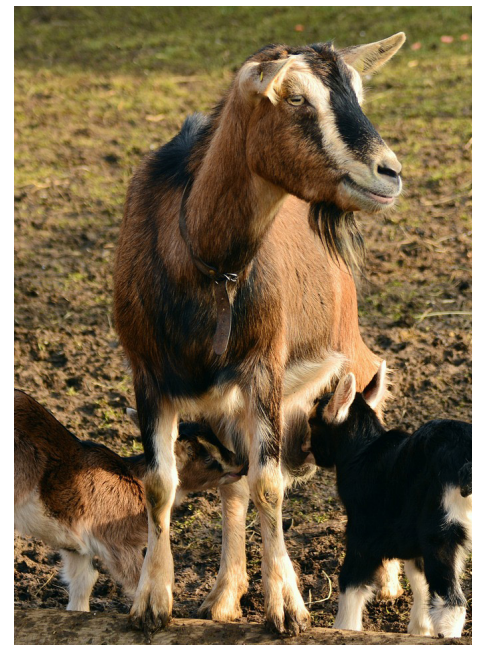
The Right to Farm Law, RSA Chapter 432, allows for properly managed agricultural enterprises to continue operating in residential areas.

Summer heat can be harder on animals than winter.

*Refer to the “Manual of Best Management Practices (BMPs) for Agriculture in New Hampshire” for specific guidelines on proper animal waste handling and barnyard management. Online: <https://www.agriculture.nh.gov/publications-forms/documents/bmp-manual.pdf> or call the New Hampshire Department of Agriculture, Markets & Food, at 603-271-3551.

There are several factors to consider when planning adequate livestock shelter in cold weather:

- **Air quality:** Animal shelters should be open, providing natural ventilation, or enclosed, using fans and proper air inlets around the ceiling perimeter to provide good air circulation. Tight buildings result in a buildup of respiration gases and animal odors, which can irritate the animal's lungs and cause pneumonia. Dangerous ammonia levels¹ can also build up and lead to suffocation death of animals and their caretakers.



- **Drafts:** Animals can stand cold temperatures, but you should protect them from drafts. Constructing panels in front of an open building can reduce drafts. Consider drafts at animal height, not person height. When animals are allowed to run loose in a pen instead of being confined, they will search for the most comfortable spots as needed.

- **Dry bedding area:** Animals will be far more comfortable in the cold if they have clean, dry bedding. A thick, dry bed provides insulation from the cold ground and decreases the amount of energy the animal has to expend to keep warm. Shelter from the snow and rain allows an animal's coat to remain dry, which provides maximum insulating value.

- **Fresh water²:** All animals need water to survive. Under cold conditions, provide fresh water often or use freeze-proof watering devices. Animals will drink more when water is 50°F.

- **Adequate food:** Animals can endure severe cold temperatures if they eat enough food (energy) to maintain their energy reserves (body fat). Animals need energy for growth, maintenance, and production. Extra energy is expended to keep warm. Therefore, they will require additional amounts of good quality feed during cold weather. For herbivores, free choice hay in hay racks should be supplied in addition to a species-appropriate concentrate or prepared ration.

Space

Refer to the table on the next page for estimates on the space needs of various animals for confinement, exercise yards, and pasture. If zero pasturing is practiced, you will have to provide adequate purchased feed, have an exercise yard, and develop a sound plan for manure management.

If you do provide pasture, the number of animals it will support per acre depends on soil fertility and environmental considerations. These conditions vary widely across the state. Rotational grazing³ — the practice of sectioning off a piece of a pasture with electric fencing and confining animals in that section, then repositioning the fence and moving animals to another section depending on grass growth— prevents pastures from being overgrazed, supports best management practices to control internal parasite loads, and will support more animals than a set stock system.

The following table (Figure 1) lists the suggested minimum space required, housing types and fencing needs of various farm species, along with the number of animals that will meet the food, fiber, recreation and other needs of an average family farmstead. This is a rough guide. For more information and guidance, contact your local County Field Specialist.

¹ Dangerous ammonia levels: [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex8271/\\$file/086-6.pdf](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex8271/$file/086-6.pdf)

² Individual water requirements: <http://www.ag.ndsu.edu/pubs/ansci/livestoc/as1763.pdf>

³ Rotational Grazing Guide: <https://extension.psu.edu/four-steps-to-rotational-grazing>

Figure 1: Suggested Space and Housing Guidelines for Fully Mature Farm Animals

Animal	Horse	Beef Cow	Dairy Cow	Dairy Goat	Pig	Sheep	Hen	Broiler	Turkey
Unit	1 horse	1 cow	1 cow	1 goat	1 pig	1 sheep	1 hen	1 broiler	1 turkey
Enclosed Housing Area/ Animal	-Tie stalls 45 sq. ft.; 5'x9' -Box stall 12'x8' or 10' by 10'	75-100 sq. ft.	75-100 sq. ft.	20-25 sq. ft.	48 sq. ft. with exercise yard; 100 sq. ft. without exercise yard	20-25 sq. ft.	3-4 sq. ft.	3-4 sq. ft.	6 sq. ft.
Exercise Yard Area/ Animal	200 sq. ft.	100-125 sq. ft.	100-125 sq. ft.	50 sq. ft.	200 sq. ft.	50 sq. ft.	10 sq. ft.		20 sq. ft.
Pasture Area/ Animal	1-2 acres	1-2 acres	1-2 acres	0.2-0.3 acres	12-14 sows/ acre/ rotational pasture	0.2-0.3 acres	-----	-----	100 sq. ft.
Type of Housing and Bondary Setback	Enclosed ventilated barn or open 3-sided barn setback 50 ft.	Open front 3-sided barn. Setback 50 ft.	Open front 3-sided barn, free-stall or enclosed stanchion barn. Setback 50 ft.	Enclosed barn with removeable side panels or windows. Setback 50 ft.	Enclosed barn, huts, shed, hutches or lean-to. Setback 50 ft.	Open front 3-sided shed. Setback 50 ft.	Enclosed barn. Setback 50 ft.	Enclosed barn. Setback 50 ft.	Enclosed barn. Setback 50 ft.
Fencing	-Electric -Wooden rail -Woven wire	-Barbed wire -Electric -Woven wire	-Barbed wire -Electric -Woven wire	-Electric -Woven wire	-Electric -Plank rail	-Electric -Woven wire	-Chicken wire	-----	-Chicken wire
Family Needs	1 horse per family member	1/2 - 1 beef animal/ year: raise 2 /yr to provide steady supply	1-2 cows	2-3 goats	2 pigs per yr.	6 sheep	6 hens	24 broilers	12 turkeys

Note to municipal planners: The minimum space and housing guidelines in the chart apply to both commercial farms and backyard operations. However, you should not apply the numbers of animals suggested in the “Family Needs” category to commercail farms when drafting ordinances regulating agriculture in your community.



About the Authors

Original fact sheet written by David Seavey and John Porter, Extension Educators, June 2009. Updated by Dot Perkins, Field Specialist, Dairy Forages and Livestock Team, December 2017. Updated by Kendall Kunelius, Field Specialist Agricultural Business Management, March 2023.

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American Association of Equine Practitioners

Care Guidelines

FOR EQUINE RESCUE AND RETIREMENT FACILITIES



VI. PASTURES, PADDOCKS AND FENCING

Pastures are an important aspect of many rescue/retirement facilities. Pastures allow horses to have access to grass as needed, give them room for exercise, and allow them normal socialization. The size and number of pastures and/or paddocks at a facility should be appropriate for the number of horses intended to be kept. Important factors to consider are safety and injury prevention as well as sufficient room to allow plenty of exercise.

Stocking requirements of pastures will vary, depending on feed and quality of the pastures. Generally, one or two acres per horse are required. Horses have a natural herd instinct, and as such, will prefer to be with other horses. In addition, pasture containment with proper shelter will serve a facility better than stalls only.

Pastures and Range Management

Horses on pasture or range should have an adequate quantity and quality of feed and water. Properly maintained pastures may provide all or most of the nutrient requirements of grazing horses. Nutrient content of pastures should be closely monitored and supplemental feed provided when necessary. Salt and mineral supplements should be provided when necessary to supplement specific nutrient deficits in grasses and forage.

To prevent digestive and health problems, horses should be introduced to pasture gradually or cautiously, especially in heavy growing periods such as spring in some areas. Horses on pasture should be inspected regularly, paying close attention during high-risk periods (seasonal changes, introduction of new horses, foaling, etc.).

Application of fertilizers, pesticides, herbicides and manure to pastures should be planned and conducted to minimize risk to grazing horses and the environment. In addition, pastures and range land should be inspected regularly for poisonous plants.

Pasture and Paddock Fencing Safety

Pastures and paddocks should be properly fenced to safely confine horses. The suitability of type of fence varies according to the disposition of the horses, as well as stocking density and pasture/paddock size. Horses should be introduced to unfamiliar fenced areas during daylight hours and be monitored to reduce the risk of injury.

Fences and gates should be maintained in good repair to minimize the risk of horses gaining access to public roadways. Barbed wire and narrow gauge high tensile wire, because of their cutting properties, can cause severe injury to horses. These materials are not ideal, even though they are sometimes used for fencing extensive pasture areas. However, they should generally be avoided in closely confined paddocks or small pastures.

Pastures, paddocks and range should be free from equipment, machinery, debris and refuse that have the potential to cause serious injury.

Paddock and Small Pasture Management

Every property in which horses are kept should have a sufficient number of paddocks or pastures to permit separation of incompatible animals. The risk of injury increases when horses are overcrowded. Competition for food, water and space often leads to fighting and subsequent injury.

The number of horses and their grouping in each paddock or small pasture should be appropriate for compatibility and for the ground conditions, taking into account the climatic conditions at the time. For example, rocky areas and steep hills/stream banks/ditches should be avoided for geriatric and debilitated horses.

Paddocks and small pastures should be cleaned regularly. Horses will not eat pasture grass or forage that is contaminated with manure. Without regular cleaning the effective grazing area is decreased.

Effective parasite control is more difficult in paddock or small pasture environments. Pasture rotation, manure removal and internal parasite control with effective deworming programs are a part of an integrated program of management. Your local veterinarian can help in the development of a specific program to fit individual conditions.



| horses

Owning a horse is no simple task; it requires a significant amount of time and monetary expense to care for and house a horse. When properly cared for, a horse has a life span estimated between 25 and 45 years. Presently, there are 267 different breeds of horse, each with a unique skillset to accommodate various activities. Some breeds perform better as leisure horses, while other are better sporting breeds, so it is important to consider what you will want to use your horse for prior to purchasing it.

Regardless of the breed of horse you choose, all horses are routine animals and benefit from having a set schedule and regimen every day. Waiving from their schedule could result in panic or fear. A horse should have access to water around the clock, as horses can drink over 10 gallons per day. Salt blocks should also be provided to encourage a horse to drink more water, especially during summer months. Anyone considering purchasing a horse should know that they require much more than a regular domesticated pet.

How are horse ages classified?

- **Colt** – a male horse younger than four years of age.
- **Filly** – a female horse younger than four years of age.
- **Foal** – a male or female horse that is less than one year of age.

- **foal** – a male or female horse that is less than one year of age.
- **Gelding** – a castrated male of any age.
- **Mare** – a female horse older than four years of age.
- **Stallion** – a non-castrated male horse older than four years of age.
- **Yearling** – a male or female horse that is between one and two years of age.

Regardless of their age, horses need daily care and exercise. Prior to purchasing a horse, you should be sure that you have enough time to dedicate towards grooming, training, and daily exercise.

What do horses eat?

- Alfalfa.
- Bran.
- Cubes (alfalfa or hay).
- Grains.
- Grass hay.
- Processed feed.
- Root vegetables.
- Supplements (according to a horse's specific needs).

Housing a horse

Before getting a horse, a primary concern should be where you are going to house it. For a prospective horse owner with their own property, maintaining a horse can be easier because the animal is on-site, which allows you to spend unlimited time with your horse and allows you to manage their stable with your standard of care. If you plan on housing a horse on your property, the horse will need a covered shelter, preferably a box stall that is a minimum of 10 by 12 feet. They must also have an exercise area of at least 5,000 square feet, but upwards of 20,000 square feet is ideal. The more room your horse has, the better.

Alternatively, a pet horse can be kept at a stable, where you lease or rent a stall. Some stables are all-inclusive and take care of brushing, daily exercise, and feeding. These stables often have a higher monthly cost, but might be worth the extra money if you cannot visit your horse on a daily basis. Some high-end stables even keep a farrier and horse veterinarian on-hand, making every aspect of horse ownership less complicated (though more expensive).

Supplies most horse owners need:

- | | |
|----------------|------------------|
| • Bedding. | • Mane comb. |
| • Bit. | • Manure fork. |
| • Body brush. | • Reins. |
| • Bridle. | • Riding helmet. |
| • Curry comb. | • Saddle. |
| • Dandy brush. | • Saddle pad. |
| • Fly spray. | • Salt blocks. |
| • Halter. | • Sponge. |
| • Hoof pick. | • Stirrups. |

Your horse will also have to visit a farrier approximately every 8 weeks. A farrier is a horse hoof specialist that shaves down hooves and shoes them. Because horse feet grow like human fingernails, they require maintenance to prevent pain and ailments such as hoof abscesses, thrush, contracted heels, and quarter cracks. The farrier will determine how much of the hoof needs to be shaven.

Temperament

Horses have a unique personality. They are prey animals with strong, innate fight-or-flight responses. Because they are easily startled, it is important to build a solid bond with them and form mutual trust. Horses are herd animals that follow a pecking order similar to a dog; because of this, you have to establish yourself as the dominant one. Once you establish dominance, understand that horses have a unique ability to sense human emotion, meaning if you're scared or stressed, so are they. In stressful situations, horse owners must remain calm.

As seen with race horses, a horse has significant spatial awareness and is able to move according to others' movement as

As seen with race horses, a horse has significant spatial awareness and is able to move according to others' movement, as well as predict the future movement of other horses. They have incredible memory and sensory systems and are able to detect the slightest noise or faintest hint of a potential oncoming predator. If a new item is introduced to their housing area, they instantly detect something isn't right and will study it intently before reacting and fleeing or coming closer for a better look.

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testimonials

" The most friendliest staff that really makes you and the dog feel comfortable. Great prices. Beautiful and clean office. "

— tommy c.

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office location

Phoenix:

3151 E Chandler Blvd
Phoenix, Arizona 85048

 [Map & Directions](#)

Call: (480) 759-9721

C.2 - General Plan Implementation

C.3 - Dark Sky Ordinance

LIGHTING CODE COMPARISON LIST

	JHA	Lighting Code Section	Site/Use Changes	Non-Res Total Output per Net Acre (lumens)	Res Total Output per Net Acre (lumens)	Multi-Family Total Output per Net Acre (lumens)	Restrictions on Color (Kelvin)	Preferred Source	IDA Certified	Restrictions
	Chino Valley (UDO)	4.24 OUTDOOR LIGHTING	>25%	100,000	4,720	2,360	No	LPS	No	11pm Time limits on Class types, fixture placement, outputs, service stations, airport, signage and lighting design standards
	Clarkdale	8 OUTDOOR LIGHTING	All	100,000	5,500	5,500	No	LPS	No	10PM Limit on Events, A.R.S., Title 49, Chapter 7, Light Pollution § 49-1101 det seq., is hereby incorporated by reference. (Prior code § 8-1), Parking light standards
	Cottonwood	408 OUTDOOR LIGHTING	All	100,000	4,500	3,300	Yes	LPS	Yes	11pm Time limits on Class types, fixture placement, outputs, service stations, signage, airport lighting, lumens, fixture types, IDA standards by reference, (limit of 3000 kelvins), limit on light pole heights.
	Camp Verde	405 OUTDOOR LIGHTING	All	100,000	20,000	5,500	Yes	LPS	Yes	10pm Time limits on Class types, fixture placement, outputs, service stations, airport, signage, motion sensors required, IDA standards adoted by reference,
	Jerome	501.B EXTERIOR LIGHTING	ALL	N/A	N/A	N/A	No	N/A	No	IDA standards encouraged for new fixtures, placement and orientation, signage (this codes more geared towards limiting signage lighting)
	Sedona	5.8 EXTERIOR LIGHTING	>25%	70,000	Lamps cannot emit a Correlated Color Temperature in excess of 4,000 Kelvin	Lamps cannot emit a Correlated Color Temperature in excess of 4,000 Kelvin or 3,850 Lumens	Yes	LPS	Yes	10pm Time limits on Class types, fixture placement, outputs, service stations, signage, airport lighting, lumens, fixture types, IDA standards, limit on light pole heights, Swimming pools (limit 2,700 kelvins),
	Prescott Valley	13-26a OUTDOOR LIGHTING	All	100,000	2,000	Lowest Levels recommended by IESNA	Yes	IESNA recommended	No	11pm Time limits on Class types, fixture placement, outputs, service stations, signage, airport lighting, lumens, fixture types, IESNA and IDA standards adopted by reference, limit on light pole heights, mounted fixsture height limits
	Prescott	3-12 OUTDOOR LIGHTING	All	IESNA recommended	2,680	Lowest Levels recommended by IESNA	No	IESNA recommended	No	11pm Time limits on Class types, fixture placement, outputs, service stations, signage, airport lighting, lumens, fixture types, IESNA and IDA standards adopted by reference, limit on light pole heights, mounted fixsture height limits, average-to-minimum uniformity ratio shall not exceed four to one (4:1)
	Wickenburg	14-19-9 LIGHTING	>25%	N/A	N/A	N/A	N/A	N/A	No	10pm Time limits on most Class types, fixture placement, outputs, service stations, signage, fixture types, limit on light pole heights, mounted & standalone fixture height limits.
	Yavapai County	603 LIGHT POLLUTION CONTROL	All	100,000	20,000	7500	No	LPS	No	10pm Time limits on Class types, fixture placement, outputs, service stations, airport, signage, motion sensors required

	Flag	Division 10-50.70: Outdoor Lighting Standards	>25% (modification after August of 1999 are not exempt)	17,000 (Zone 1) 35,000 (Zone 2)	1,500 (Zone 1) 5,000 (Zone 2)	1,500 (Zone 1) 5,000 (Zone 2)	Yes	IESNA Certified/Registered Engineer must certify design.	Yes	9pm Time Limits in zone 1 (11pm in zone 2), Two (2) Lighting Zones, restrictive sheilding standards by zone, time duration limitations, motion sesning/automated timers required, lighting class types can be as applicable to Uses, architectural landscaping and lighting reviewed concurrently, lighting system designs must be certified by a registered engineer.
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Zone 1 = < 2.5 Miles from U.S. Naval Observatory
Zone 2 = >2.5 Miles from U.S. Naval Observatory

MORE FOCUS TOPICS OF CONSIDERATION AND RECOMMENDATIONS FOR DISCUSSION

Community Lighting: Standards, Designing and Planning for Dark Skies

Discussion Topics

- Incorporating the IDA and IES LCS guidelines as a part of our lighting design criteria; site application, fixture form/style/scale and performance.
- When choosing a fixture style, matching the character of the surrounding as well as minimizing up light are both important criteria.
- Balancing lumen output, spacing & performance with visual comfort, uniformity & safety.
- Manufacturers have a responsibility to provide the design community with viable product options that meet IDA and IES recommendations.

1. Energy waste
2. Safety & security
3. Ecology
4. Health concerns
5. Dark skies

Addressing the issues:

- A. Use the minimum effective luminance
- B. Only illuminate the area of activity
- C. Only during hours of activity
- D. Maximize luminaire efficiency
- E. Power spectrum matters

Implementation Action Timeframes



Short-term

Actions should be completed within 1 to 4 years of Plan ratification.



Mid-term

Actions should be completed within 5 to 10 years of Plan ratification.



Long-term

Actions should be completed more than 10 years after Plan ratification.



Ongoing

Actions should occur on a continuous basis once implemented.

Aspects of lighting Ordinance Section 4.24	Potential Weaknesses	Solution
APPLICABILITY- (Section A. thru C.)	a) The threshold for exemption is >25% that may create a board window and could lead to excessive lighting. b) More exemption fails to incorporate and adapt to new lighting technologies	a) Require lighting standards to be upheld for all new, existing and non-conforming uses to bring up to compliance b) Require photometric review and/or assessment on all projects regardless of work extent.
APPROVED MATERIALS AND METHODS OF CONSTRUCTION OR INSTALLATION/OPERATION (Sections A. thru P.)	a) Ambiguous or outdated standards for acceptable lighting. b) Inadequate consideration of the environmental impact. c) Inadequate measures to control light pollution.	a) Establish more specific standards and criteria for location, height restrictions and maximum kelvin outputs. b) Adopt IDA standards and design concept as appropriate to community. c) Require more education and awareness programs.

ROLAN Manifesto for lighting professionals

The Responsible Outdoor Lighting At Night (ROLAN) Manifesto sets out ten core principles for external illumination and a plan of action to implement positive change in the lighting community to lead to a more sustainable, healthier, and safer future for all.

1. Everyone should have the right to access darkness and quality lighting, and light needs to be used and distributed fairly without discrimination.
2. Start your design with darkness and only add light if it supports nocturnal placemaking and protects a view of the stars.
3. In all projects, strive to maximise the benefits of outdoor light at night by creating legible, safe spaces and journeys, simultaneously limiting each project's environmental and financial costs.
4. Apply the Five Principles of Responsible Outdoor Lighting in all lighting projects:
 - All light should have a clear purpose.
 - Light should be directed only to where it's needed.
 - Light should be no brighter than necessary.
 - Light should be dimmed down or turned off when not required.
 - Use warmer colour lights where possible.
5. Collaborate with researchers from different disciplines and specialties, such as astronomers, ecologists, biologists, lawyers, etc., so they can provide expertise on unfamiliar topics.
6. Educate your clients about the importance of ROLAN.
7. Ensure the community you work with is an active stakeholder and participant in all lighting projects. Enquire about their needs and wishes at night, and provide them with access to information to make informed decisions.
8. Embrace technology by asking for support from the lighting industry to ensure that night-time biodiversity is sustained, and energy consumption is reduced. Engage with the lighting design industry to deliver an appropriate lighting solution.
9. A circular economy should be integrated into the brief, design, specification, and manufacturing process of your project, as well as its installation.
10. After project completion, visit the site at night with community stakeholders, to verify that your lighting design was fully implemented and meets ROLAN principles.



Because the UN Sustainable Development Goals (above) do not explicitly refer to external illumination and its multiple impacts, the Founding Partners of the ROLAN movement, are keen to address this in support of the SDG Goals. By following the principles outlined in the ROLAN manifesto, governments, businesses, and individuals support the implementation of the following SDG.

The principal authors of the ROLAN Manifesto are Dr Karolina M. Zielinska-Dabkowska - the ILLUME research group/the Gdansk University of Technology; and Ruskin Hartley - the International Dark-Sky Association, with contributions and support from further Founding Partners: the Society of Light and Lighting (SLL), the International Association of Lighting Designers (IALD), the Illuminating Engineering Society (IES), the Institution of Lighting Professionals (ILP) and the Lighting Industry Association (LIA).

If your organisation would like to support ROLAN movement, please contact: k.zielinska-dabkowska@pg.edu.pl

Light pollution destroys critical wildlife habitat.



Plants and animals depend on natural light cycles to govern life-sustaining behaviors such as reproduction, nourishment, sleep, and protection from predators. Scientific evidence suggests that artificial light at night has deadly effects on many creatures, contributing to the decline of biodiversity worldwide.



Migratory birds

Artificial lights can cause migrating birds to wander off course towards dangerous nighttime landscapes and cities. Millions of birds die colliding with needlessly illuminated buildings and towers every year.



Sea turtles

Hatchling sea turtles find the sea by detecting the bright horizon over the ocean. Artificial lights draw them away from the ocean. In Florida alone, millions of hatchlings die this way every year.



And many more...

We are just starting to understand the devastating effects of artificial light on habitats. Every year, new research adds even more wildlife to the list of affected animals, including:

- Hummingbirds
- Wallabies
- Little penguin
- Zebrafish
- Sweat bees
- Songbirds
- Peahens
- Bats
- Owls
- Mice
- Seabirds
- Monarchs
- Atlantic salmon
- Zooplankton
- European perch
- Insects
- Geckos
- Fireflies

WHAT CAN I DO?



Protect wildlife through sensitive lighting choices.

- **Get to know your neighborhood at night.** It's hard to protect what you're not familiar with.
- **Use only fully shielded, fixtures for all outdoor lighting,** so lights shine down, not up.
- **Use only the right amount of light needed.** Too much light is wasteful and harms wildlife.
- **Install timers and dimmer switches** and turn off lights when not in use. If you must have security lighting, use motion sensors.
- **Turn off office and home lights when not in use.**
- **Use only lighting with a color temperature of 3000K and below** to reduce the blue cool light that is more harmful to wildlife.
- **Work with your neighbors and local governments** to ensure outdoor lighting isn't harming the wildlife in your area.



DarkSky



Learn more about light pollution and wildlife habitats.

darksky.org/resources/what-is-light-pollution/effects/wildlife-ecosystems