Comments Submitted Regarding the Proposed Voluntary Bird-Safe Building Standard

Submitted By Dr. Daniel Klem and James M. Cubie, J.D.

**Introduction** We thank the Commission for the opportunity to comment on the proposed voluntary bird safety standards in new commercial buildings.

We compliment the Commission's commitment to develop regulations to prevent bird window collisions in new commercial buildings. A bird-safe building code is by far the most effective action a state can take to prevent avian deaths. It is especially significant that this regulation is being developed in California. About 8% of all new buildings in the United States are built in California each year. California is looked to as a leader nationally in conservation policy.

We also commend the staff member of the commission for her responsiveness to comments and questions which we have raised thus far.

**We can summarize our comments thus: California, the nation’s a leader in conservation policy, should do much better.**

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These are basic points we wish to make:

1. **A Win for Both Builders and Birds** Thisvoluntary standard is a great opportunity for builders to build a better image. Corporations spend millions to improve their image. Here is an opportunity where they improve their image it at an insignificant cost.
2. **Windows: Very Small Portion of a Building’s Cost** A bird-safe glass requirement only affects the cost of the glass. The cost of fabrication, delivery and installation are about the same. Thus, the cost of bird-safe glass to a builder is very low and places little financial burden on the industry.
3. **A Cost/Benefit Comparison Shows that the 36-Foot Bird-Safe Height Should Be Raised to 100 Feet** A 40-foot bird safe height is low. It is further lowered by the provision stating that only “10% of the first 40 feet must be bird safe.” As such it creates a four-foot exemption. Raising the bird safety level to 100 feet will save 1.7 million birds, assuming a 10-year life of the code, at a cost of 0.07% to the construction industry. By way of comparison, the average cost of change orders (12.5%) are 38 times the added cost of bird safe glass.
4. **A phase-in is clearly preferable to lowering the safety standard below 100-feet.** A phase-in period provides time of developing the bird-safe glass manufacturing capacity and allays the industry’s cost concerns. The higher safety standard will reduce avian deaths for decades. The long-term savings clearly outweigh any loss in avian deaths due to a phase-in.
5. **The Four-foot Exemption Is Not Justified** It is unnecessary, undermines the purpose for which the regulation is proposed and increases avian deaths by over 1 million.
6. **Lower Than 100-Foot Standard in Other Codes.** The bird-safety standards lower than 100 feet in other municipalities are based on the misconception that bird-safe glass is so expensive that it is unreasonable to require it above that level. This is wrong. For example, both Washington D.C and Berkeley follow that American Bird Conservancy’s recommendation of the 100-foot standard. California leads the nation in conservation policy and should do so in this instance as well.
7. **Additions to the Standard** Several drafting improvements in the proposed code are offered.

**Recommendation**

This proposed voluntary standard should be adopted with a clear statement from the commission that it will upgrade the standard to address points 3-5 before it becomes mandatory.

**Submitters** These comments are being submitted by Dr. Daniel Klem, the director of the Acopian Center for Ornithology at Muhlenberg College and by James Cubie, J.D. who is a consultant to the center. Dr. Klem is the leading bird window collision expert in the United States on window collisions. His research is the basis for current bird-safe window standards. He continues to evaluate proposed bird-safe the technologies and he consults with many governmental entities throughout the world

Jim Cubie is a consultant to the Center. He has worked on policy issues related to bird window collisions since 2019. In his previous career, he was Chief Counsel of the Senate Agriculture Committee in Washington D.C. In that position he was responsible for the development of the basic policies in the farm bill and other related legislation. He acquired the skills to evaluate the relationship between the economic and the scientific aspects of a regulation. Most of the ornithological experts in the field, to which the staff has consulted, do not have experience in regulatory and legislative development.

Cost is a fundamental consideration in any regulation. To assist this commission and others, he has prepared a study of the economic cost of regulations which require bird safety standards in new construction. The results of the study have been confirmed by independent architects. It is available at the Ornithology Center’s Safe Building Resource Center.

<https://ornithologycenter.com/commercial-building-resources/>

**Essential Improvements in the Standard**  If the Commission does not choose to consider changes at this time, these comments are made with a view toward improving the draft regulation before it becomes mandatory. The following comments assume that it is mandatory.

Our comments make the following points:

Section 1 A bird-safety building code standard will not have a significant negative effect on the level of construction activity in California.

Section 2. A comparison of the costs vs. the benefits of raising the bird safety level to 100 feet clearly show it is very beneficial. It will save an estimated 1.7 million birds at an added cost of only one third of one per cent in the cost of construction.

Section 3. The 10% exemption lowers the bird safety standard to about 36 ft. The regulatory record does not include an explanation or justification for this lower level. It is especially hard to understand why it is adopted since the regulatory document states that the “lower floors typically pose the greatest threat to birds. If the 10% exception is added to address the concern of the retail industry, as written it will result in exposing birds unnecessarily to the 84% which are not retail buildings. We suggest better alternatives.

Section 4. Additional Provisions Which Need to Be Added to the Regulation.

In the following reference is made to the “added cost of bird-safe glass.” A report describing the analysis and a related spreadsheet for a description of the assumptions used compute these estimates.

Section 1. A bird-safety building code standard will not have a significant negative effect on the level of construction activity in California**.**

**Bird-Safe Glass and Investment Decisions**

When a builder/investor decides whether to construct a building he assumes that there will be changes in cost during construction. He takes these into account when he estimates his net return. These are: (1) changes in the cost of major materials, (2) cost overruns and (3) change orders. Comparing the cost of these elements puts the cost of bird-safe glass in perspective.

1. Expected change in the cost of materials is (9%) is 14 times the added cost of bird- safe glass, based on historic, not current data
2. Average cost-overruns (16%), are 49 times the added cost of bird-safe glass.
3. Average change orders (12.5%) are 38 times the cost of bird-safe glass.

In sum, a builder accepts the uncertainty that $5.9 million may be added to the initial construction estimate. He can clearly plan for the added cost of bird-safe glass which is predictable. It is so small - only $30,000- for the full 100 feet that it will not affect his decision one way of another. It is 0.2% of the estimated cost.

**Current Cost of Bird-Safe Glass** The economic analysis of the added cost of bird-safe glass shows that the added cost of bird-safe glass is very low - even when its cost 28% more than standard glass. The cost of bird-safe glass at present is not as low as assumed in the analysis. The reason for this approach is that a bird-safe building regulation will be in place for decades. To use higher short-term costs would bias the analysis. A short-term cost-curve could have been added, but since this standard will affect the cost and benefits of 40,000 buildings, it would not affect the results to a significant degree.

**The Cost of Bird-safe Glass Cost Will Fall**

This and similar regulations in many other jurisdictions will increase the demand of bird-safe glass and drive down its cost. According to the Swanson’s law, every doubling of the demand for a glass product reduces its cost by 20 per cent. Because twenty communities have enacted or are in the process of developing birds safe glass regulations, the market will drive down the price. Thus, it is reasonable to expect those reductions in the cost of bird-safe glass cost to occur in the relatively near future. Another glass product, solar collectors, have dropped in price by 89% since 2010.

**Conclusion and Recommendation**

The Commission can be confident that when it approves a mandatory bird-safety standard, it will not significantly burden the construction sector.

**Section 2. A comparison of the costs vs. the benefits of raising the bird safety level to 100 feet**

**California Law requires a comparison of the costs and benefits of new regulations.**

In the following the “cost” is the added cost to builders caused by raising the bird-safe standard to 100 feet. The “benefit” is the number of bird fatalities saved by the 100-foot standard.

**(a)Single Building Comparison of Cost and Benefits.**

The cost and benefits can be compared on a building-by-building basis or statewide. In the case of an individual building, if the bird-safe standard is raised to 100 ft, it costs the regulated builders only 0.07% percent, but the bird-safe level is raised by over 200 percent. The benefits of raising the safety standard are far greater than the increased cost to the builder.

**(b) State-Wide Comparison of the Cost and Benefits of the 100 ft. Safety standard.**

To compare the two safety standards two steps are necessary.

1. An assumption must be made of the added bird deaths from the lower standard compared to the 100-foot standard
2. An estimate to cost to the industry of the 100-foot standard.

##  Assumption of the added bird deaths from the lower standard compared to the 100 ft. standard

To establish a sound policy, it is not necessary to make an exact estimate of the added bird deaths by retaining the 36 ft. standard. Instead, the analysis can be based on an assumed level of mortality. To be valid it should be based on sound science and be conservative. If using conservative assumptions, the benefits are greater than the costs, *a fortiori,* the benefits will be greater if number of birds saved is greater.

Thus, we do not attempt to predict that exact number of added deaths caused using the 36-foot standard, compared to the 100-foot standard. Instead, we assume that there would be only two (2) additional bird deaths per building per year. This is not a prediction of the number of added deaths. It is an assumption used to permit a comparison of the costs and benefits. The number of added deaths may be higher, but is extremely unlikely to be lower than two birds per building.

The document upon which the 40-ft standard is based states that only 70% of the fatalities will be prevented at this height. Thirty percent of fatalities will not be prevented. The most cited estimate of bird fatalities by building height is an article in the ornithological journal Condor. It estimates that 20-23 birds are killed by commercial buildings. If the 30% is applied to the Condor estimates one could expect about 6-7 fatalities. *Bird–building collisions in the United States: Estimates of annual mortality and species vulnerability*, Scott R. Loss, Tom Will, Sara S. Loss, and Peter P. Marra The Condor, 116(1) : 8-23 American Ornithological Society URL: <https://doi.org/10.1650/CONDOR-13-090.1>

Since increasing to 100 feet is 260% higher than the 36-foot standard, 2 additional bird fatalities due to the lower safety standard is a reasonable assumption**.**

The analysis is based on these further assumptions:

1. Raising the safe level from 36’ to 100 ft. saves two birds annually.
2. The regulation will be in effect for 10 years. There will be about 40,000 new buildings during this period under the 36 ft. standard.
3. These buildings will have useful life of 20 years.
4. The cost of raising the safe level from 36 feet to 100 feet is 0.07%  (See calculations in the analytical tool found at [P64 in the “base Worksheet. https://ornithologycenter.com/commercial-building-resources/](file:///C%3A%5CUsers%5Cjimcubiegmail.com%5CDocuments%5Cbird%20strikes%5COrdinances%5Ccalifornia%5C%20P64%20%20in%20the)

**Results. In this analysis we find that using the lower 36 ft standard will result in about 1.7 million additional bird deaths, at an added cost to the builders of 0.07%. These deaths occur over the life of the buildings approved under this code, assuming the code is in force for 10 years.** These estimates for analytical purposes, not predictions.

How can it be so large?

**The Multipliers – Why Codes Are So Important**

The proposed code will apply to about 40,000 new buildings over the next 10 years. Each of those buildings will be causing added bird deaths for 20 years because of the low 36 ft. standard.

A small increase in bird mortality has very large consequences.

## An Estimate of the Added Cost of Increasing the Safety Level to 100 feet to the Builders.

The cost to the regulated industry of increasing to the 100 ft level is only about 0.07% of the cost of a new building. It is only $18,000 for a $18,000,000 building.   It is so low because (1) only the cost of the glass will increase to meet bird safety standards and (2) it is only the added cost of increasing from 40 feet to 100 feet that is relevant. Most of the cost of a window is the cost of a frame, the fabrication and shipping and the installation. Thus, increasing the level to 100 ft is very small. This is shown in <https://ornithologycenter.com/commercial-building-resources/> Base Spreadsheet at O34.

Conclusion - Positive Comparison of Benefits and Costs.The cost vs.benefit comparison is very clear. The higher bird safety level (100 feet) will save about 1.7 million birds at a cost to the builder of only 0.07%. That is a positive benefit vs. cost ratio in favor of the higher safety limit of over 1,000 times.

**Parking Place Costs Compared** Some local ordinances require a certain number of parking spaces for every X square feet of a building. It costs $28,000 for a free-standing space, not including land cost. Why don’t we save the builders the cost of one parking space in return for a higher bird safety level? The net savings to the builder will be $10,000.

**Section 3 The Ten Percentage Exemption**

Since the original proposal was made public a provision exempting 10% of the 40 foot bird-safe area has been added. This provision is completely (1) unnecessary, (2) it will undermine the very purpose of the regulations and (3) will end up killing an additional 1.7 million birds, plus all the nestlings they would have borne. It may be that this provision was added at the request of the retail industry. If it was not, my apologies to that sector.

**10% for Flexibility**

In some other jurisdiction there is a 10% exemption “for flexibility.” There is no explanation in the background material supporting this exemption that I have been able to find.

There is no need for “flexibility.”

**Is Flexibility needed to avoids Costs?**

It clearly is not. The Economic and Fiscal Impact Statement states:

“Many designers of bird-friendly buildings note that costs are not significant if the features are incorporated early in design; retrofitting elements to shield glass will add cost, but economical options can be found. P. 2 BSC 04-22)

For example, the added cost of bird-safe glass for a floor which has entirely glass front, is between $2,000 and $8,000. This is a minuscule cost in the context of the cost of a , which will likely be in the millions of dollars.

**Is Flexibility Needed Because of Unavailability?** No. Bird-safe glass is just a form of glazing. It can be used in just about any type of window configuration. There are over 20 suppliers of approved bird-safe glass who can compete to develop a solution for a specific situation.

Additionally, there are window treatments that are now commercially available to make a window bird-safe, This analysis has referred to “bird-safe glass” because it assumes that this is the product that most builders would prefer.

**I.7-million Extra Bird Deaths** A10% exemption, so what? It does not seem like much, but it increases the number of bird deaths by 10%. Even if it is only about 2 birds per building, during the life of this regulation it means 1.7 million more bird deaths. In fact, it will be much higher. Those 1.7 million birds will not breed and produce young. As the Economic and Fiscal Impact Statement states,

Because window kills affect reproductively active adult birds, the cumulative effect of saving some birds is amplified by their reproductive output.

The document this standard is based on estimates that the 40-foot standard saves 70% of birds. With this 10% exemption it saves 63%. If one uses the *Condor* (Loss, et al) estimate of 21.7 birds killed by a typical commercial building, the difference between 70% and 62% is 1.7 million extra bird deaths. As pointed out before, the exemption will apply to over 40,000 buildings, even if the regulation were only in effect for 10 years. Those building would go on killing birds for a typical life of 20 years. The ten percent exemption kills about 1.7 more birds that would have been saved without it.

This estimate is the same as the number as the section 2 because in that section “2” was used for analytical purposes. In this section it was computed based on the estimates in the documents upon which the regulation is based. See Economic and Fiscal Impact Statement, p.5.

**Directly Undermines basic purpose of this regulation** – One of the basic purposes of this regulation is to build a demand for bird-safe glass. A 10% exemption means that there will be 10% less demand for bird safe glass.

**Retail Justification** If this provision is designed to exempt display windows, it is the equivalent of driving a carpet tack with a sledgehammer.

**First, it is too Broad.**

According to Department of Energy statistics only 16% of commercial buildings are mercantile.  The other 84% are office, warehouse, lodging, food service and health care buildings. These types of buildings are not dependent on window shopping as a primary means of inducing consumer purchases. Even in the case of retail establishments, there are often windows which are blocked from the back so that there is no vision through them. Such windows are very reflective and dangerous to birds.

**Second, it is Unnecessary.**

UV based windows, with collision prevention components, can be seen by birds, but do not interfere with human vision. As the Economic and Fiscal Impact statement indicates.

Since humans cannot see UV, we would continue to enjoy the unobstructed views that we expect and value from windows.

It is essential that any UV product be carefully field tested by an independent organization. Not all UV based products are effective. Requiring bird-safe glass in the retail sector in California will demonstrate to glass manufacturers that there will a major market for this type of glass.

**Better Options for Providing Flexibility**

If the Commission still decides that there is need for flexibility, there are much better options. They are (1) an exception process, (2) a hardship exemption and (3) a phase-in.

**Exception Process** Where the applicant demonstrates to the building department that there is no bird safe product available to address a certain need, bird-safe glass would not be required. Added cost would not be a justification for the exception.

**Hardship Exemption** If the Department determines that the added cost of bird safe glass will increase the overall cost of the building by over 1%, the official is authorized to exemption that portion required to lower the cost below 0.75%.

**Phase-in Option**

Of course, in the first few years of the implementation of the regulation, bird-safe glass which is only 25% above the cost of non-bird safe glass may not be immediately available.  Thus, it would be reasonable for the commission to address this issue by offering a phased in program while the manufacturing capacity is developed. A phase-in is clearly preferable to lowering the safety standard below 100 feet. The higher standard will reduce avian deaths for decades. The long-term savings clearly outweigh any loss in avian deaths due to a phase-in.

**60% of All the windows Above 40 Feet** The regulation also says that“No less than 60 percent of building elevation, 40 feet (12 m) above grade to the top of the building elevation, shall incorporate bird-friendly mitigation strategies.” This requirement may be very beneficial, but also very costly. At present there is not enough information to make any considered judgment about this provision.

Section 4 Drafting Suggestions

There are several provisions which should be a part of this regulation. These matters may be handled at another place in the Commission’s general authority. These suggestions assume that the regulation becomes mandatory.

1.    **Penalty for violation**   There should be a substantial penalty. Too often today people are saying “I will ask for forgiveness not for permission.”

2.    **Deadline for Implementation** There should be a clear deadline for the development and adoption of any additional material necessary to implement the building code.  In Chicago it has been at least 2 years since the ordinance was passed by the City Council and the building code managers have not yet issued the final regulations.

3.    **Regulation Runs with the Building**It should be clear that these regulations apply to the building and are binding on any subsequent owner.

4.    **Removal of System** It should be a violation of the regulations to remove an existing system on a building, even if the ownership changes.

5.    **Severability Provision**There should be a severability provision which ensures that if a court rejects one part of the standard, the remainder is still in effect.

**Appendix 1. Computing the Added Bird Deaths Caused by Using a Lower Bird-Safe Height (36 feet.)**

**The number of new buildings** each year in California is at 1, C - 4,058 new commercial buildings.  Based on Deportment of Energy data.

**Birds Saved Per Buildings Annually** Assume that just 2 birds are saved by increasing the safety height from 40 to 100 feet.  See 2.C

The 4,058 new commercial buildings multiplied by the birds saved (or lost) In this hypothetical it is 2 birds.  See 3,C

**Added Death over 20-year Building Life.** Since the typical life of a building is 20 years, the annual extra deaths (2) per building is multiplied by 20 years, which yields the number in 3, C. These are the deaths from the buildings started only in the first year the code in in place.

**Life of Code Provision** The code will be in place for many, many years – assume 10 (7,B)

**All Buildings, 20 Years over that Decade**. Over that decade 40,000 more new buildings will be built all killing 2 per building per year for 20 years.  Thus the one year fatality level – in 5,C is  multiplied by 10 and the result is in 8,C  It is about 1.6 million bird deaths from the lower standard.

**Higher Bird Saving Assumptions** If we assume instead that increasing the bird safe height to 100 feet saves 4 or 6 birds, the added dead birds is 3 to 5 million.C9,C10

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| --- | --- | --- | --- |
| 1 | Number of new bldgs built annually in California (subject to new code) |   | 4,058 |
| 2 | Assumed birds saved by increasing to 100 feet |   | 2 |
| 3 | Extra bird deaths caused by the 4058 buildings in the first year |   | 8,116 |
| 4 | Typical life of a building | 20 |   |
| 5 | So the new 4,058 buildings in the first continue to kill the extra birds for 20 years |   | 162,322 |
| 6 | Future years |   |   |
| 7 | Assume that the 40' standard, which causes the deaths of 2 added birds is in place for 10 years. (This is conservative.) The number of buildings over that 10 years is  | 10 | 40,581 |
| 8 | Extra kill from the40,000 buildings built at the 40' code over the next 10 years |   | 1,623,223 |
| 9 | Extra kill if higher safety level 100' saves 4 birds |   | 3,246,446 |
| 10 | if 6 birds saved |   | 4,869,669 |
|  |  |  |  |

**Appendix 2** The economic analysis which estimates are made assume a 9-floor building, 100-foot high, of 32,400 square feet costing $562 sq. ft. The entire front of the building is glass. The total cost is $18,208,000. Three scenarios were run assuming that bird-safe glass costs 12%, 28% and 55% more than standard commercial glass. The mid-range estimate is used in these comments. The analysis can be downloaded at <https://ornithologycenter.com/commercial-building-resources/>