June 5, 2024
Environmental Commission

The Travis Audubon Society requested this report on bird safe buildings for presentation to the City of Austin and general dissemination within the Central Texas community. It was submitted to the South Central Waterfront Advisory Board on March 18, 2024, the Design Commission on April 22, 2024, and was prepared by Heidi Trudell, a bird collision prevention researcher and consultant, who in March 2024 was hired as a technical advisor by Guardian Glass.

Passing directly over Austin, North America's Central Flyway serves as the primary migration corridor[1] during spring and fall for hundreds of species of birds. Due to this geographic funneling, Texas is home to three of the top ten most deadly cities for birds[2] (Houston, Dallas, San Antonio), making it especially critical to proactively preserve biodiversity. Travis County alone has documented 427[3] species of birds, which is more than fourteen states[4] have recorded.

With bird populations in steep decline,[5] and an estimated 621 million to 2 billion[6] birds dying at windows in the US annually, it is critical now more than ever that municipal leaders, especially in ecologically significant areas like Austin, step forward to reverse the trend.

Initial steps have already been taken; Austin's dedication to bird conservation has already been established by committing to meet the standards of a Bird City.[7] This includes a pledge to reduce nonessential lighting during migration[8] that comes as part of a statewide initiative[9] to address the detrimental impact that artificial light at night has on migrating birds. As Austinites are well aware, however, it's not just birds that need dark skies to thrive; even outside of bird migration, bats are especially sensitive to lighting.[10]

[1] allaboutbirds.org/news/heres-how-to-use-the-new-migration-forecast-tools-from-birdcast/#
[2] news.cornell.edu/stories/2019/04/chicago-tops-list-most-dangerous-cities-migrating-birds
[3] ebird.org/region/US-TX-453?yr=all
[4] ebird.org/region/US/regions
[5] 3billionbirds.org
[6] meridian.allenpress.com/wjo/article-abstract/125/2/406/129654/Evaluating-the-Effectiveness-of-Select-Visual/
[7] austintexas.gov/news/austin-now-designated-bird-city-working-protect-habitats-and-promote-bird-friendly-practices
[8] traviscountytx.gov/news/2021/2113-lights-out-for-migrating-birds
[9] tx.audubon.org/urbanconservation/lights-out-texas
[10] batcon.org/new-paper-suggests-light-pollution-limits-bat-habitat/

The next step is to address the built environment directly. Glass is a dynamic material; it can reflect habitat or be entirely transparent. As a result, birds are unable to see glass[11] unless it is modified. Poorly designed buildings dramatically increase the risk of collision. One way to significantly improve the odds of survival for birds living in or migrating through Central Texas is to ensure that buildings meet bird safe standards.[12] Every building that is made bird safe - as new construction or a retrofit - will save dozens to hundreds of birds[13] *per building*, per year. Best practices in bird safe building standards align with Austin's values[14] of being a biodiverse, ecologically resilient community.

The US Green Building Council's LEED standards have incorporated the American Bird Conservancy's (ABC) research on collision prevention materials.[15] Importantly, the LEED pilot credit for bird collision deterrence was discontinued[16] in October 2023, and replaced with a simplified credit, the LEED (v 4.1) Innovation: Bird Collision Deterrence.[17] "If all materials on the building façade have [an ABC] Threat Factor of 30 or below, the project is exempt from the building façade requirements" and no further Bird Collision Rating calculations are required. This update to the credit makes it significantly more straightforward for architects to evaluate, and when appropriate materials are selected will reduce risk to birds.

Incorporated within the Bird Collision Deterrence credit is the LEED Light pollution reduction,[18] which emphasizes reduction of artificial light at night. Important factors in reducing light's impact on birds and other wildlife is controlling the directionality, timing, and temperature of lights. Appropriate lighting creates a safer night environment for all wildlife, and should be done year-round.

Since 2008, over 20 municipalities across the country[19] have implemented bird safe building and lighting codes. These are generally applicable to new construction and major glazing retrofits. Because New York City, Chicago, San Francisco, San Jose, and other cities as well as states have adopted these laws, demand for bird safe products has increased dramatically. As a result, glass manufacturers have responded with diverse offerings: etch, frit, UV, and textured glass products are among the options available to meet bird safe product demand.

[11] abcbirds.org/blog/truth-about-birds-and-glass-collisions/
[12] https://abcbirds.org/glass-collisions/architecture-planning/
[13] bioone.org/journals/the-condor/volume-116/issue-1/CONDOR-13-090.1/Birdbuilding-collisions-in-the-United-States--Estimates-of-annual/10.1650/CONDOR-13-090.1.full
[14] austintexas.gov/department/wildlife-austin
[15] abcbirds.org/glass-collisions/products-database/
[16] usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-data-41
[17] usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-data-75
[18] usgbc.org/credits/ss8
[19] law.yale.edu/sites/default/files/documents/pdf/building_safer_cities_for_birds.pdf

- Abrasive etch, acid etch, and, increasingly, laser etch products are being made available, improving procurement efficiency and providing more options from more manufacturers for projects requiring s1 etch to meet bird safe requirements.
- Frit products have historically been embraced for their thermal performance and light diffusion properties, but until quite recently have only been available on s2 and s3, where they are less effective at preventing bird collisions. Several manufacturers, both domestically and abroad, now produce s1 frit products with appropriate contrast and spacing specifications to meet bird friendly requirements, which are featured by Studio Gang on high profile projects as well as their own home office in Chicago.[20]
- UV products are becoming increasingly popular, though they have been adopted with some caution due to their historic costs and performance, as not all birds are able to see UV.[21] Early UV coatings were only available on s2 and s3, where their efficacy was greatly reduced. However, a variety of s1 UV products are now available and some are manufactured domestically, reducing lead times and risk of breakage during transport.

Costs for bird safe materials vary, but when taken into consideration from the start, can be minimal[22]. For example, the Superior Township Library in Michigan spent $12,000 extra on glass to make it bird safe[23], which was 0.00052% of the original project budget of $2.3 million; however the total project cost ended up at $5.5 million[24], meaning that the bird safe portion of the cost was 0.00021% of the total budget.

Bird safe design can result in substantial energy savings.[25] Certain types of bird safe glazing (eg, frit) or glazing alternatives (eg, structural shading) can help meet energy performance requirements with slight design adjustments and limited additional cost during construction, resulting in substantial HVAC savings over the life of the building.

- While not fully bird friendly, NASA's Building 20 at Johnson Space Center uses 57% less energy[26] by using external structural shades that do reduce risk to birds (no modified glass products were needed).
- The Javits Center in NYC replaced their original glass with bird safe fritted glass and saw a 26% reduction in energy consumption.[27]
- Research and development efforts within the glass industry continuously improves the low-e coatings compatible with bird friendly products in order to meet increasingly stringent energy reduction targets.

[20] developingresilience.uli.org/case/studio-gang/
[21] oxfordre.com/neuroscience/display/10.1093/acrefore/9780190264086.001.0001/acrefore-9780190264086-e-232;jsessionid=05D99AE89B57EBC923BC5CB903CE4C4B?rskey=Zxtqid&result=19&print
[22] muhlenberg.edu/media/contentassets/pdf/academics/biology/faculty/klem/Bird-Safe%20Glass%20Cost.pdf
[23] ypsilibrary.org/2021/09/help-fund-bird-friendly-glass-at-superior/
[24] mlive.com/news/ann-arbor/2021/10/plagued-by-covid-delays-and-skyrocketing-costs-ypsilanti-district-librarys-new-branch-forges-ahead.html
[25] usgbc.org/articles/leed-projects-save-energy-saving-birds

[26]nasa.gov/wp-content/uploads/2015/04/gbrc-display_jsc-leed-cert_b20.pdf?emrc=4ee509
[27]sites.duke.edu/leedcollisions/2015/09/07/nycs-javits-convention-center-goes-bird-friendly/

The financial argument, aside from energy savings, is regionally significant: birding results in $1.8 billion in ecotourism income for Texas annually.[28] Texas has the second highest number[29] of bird species recorded in the United States, and according to the World Economic Forum,[30] greater bird biodiversity makes people happier. This ecological richness is cause for celebration, and more importantly, preservation.

What is hindering companies from investing in… valuable conservation projects?

…lack of information about the environmental and economic impacts of their investment.
Despite their impactful environmental, economic, and social returns…
conservation projects are often boxed out of corporate sustainability portfolios.
- Texan By Nature[31]

Prepared by Heidi Trudell

Resume attached

Suggested reading:
https://tpwd.texas.gov/wildlife/birding/bird-city-texas/faq
https://www.nature.com/scitable/knowledge/library/biodiversity-and-ecosystem-stability-17059965/
https://www.statesman.com/story/news/local/2023/03/30/austin-bird-city-texas-birding-parks-wildlife- birdwatching-nature-audubon/69995848007
https://darksky.org/resources/guides-and-how-tos/lighting-principles/
https://flap.org/solutions-commercial-institutional/#toggle-id-5

[28] tpwmagazine.com/archive/2021/may/ed_1_birdcities/index.phtml
[29] ebird.org/region/US/regions
[30] weforum.org/agenda/2020/12/study-birds-biodiversity-happiness-levels/
[31] texanbynature.org/category/conservation-wrangler/

Heidi Trudell, Bird Collision Researcher & Consultant
justsavebirds@gmail.com, Linkedin.com/in/htrudell

Since 2003, when I first began studying bird collisions, I have dedicated my life to understanding the intricacies of preventable avian mortality — actively working with the glass industry, architects, campuses, municipalities, NGOs, homeowners, news media, wildlife rehabilitation organizations, and ornithologists to 'Just Save Birds'.

Although glass collision is a predictable and preventable cause of avian mortality, the sheer volume of variables influencing it create major challenges in predicting performance of products. This field is extremely new and rapidly changing, available products and best practices are constantly updated as new codes are introduced across the continent. Bird friendly building specifications are also becoming increasingly common for institutional design guidelines.

Bird Safe Design & Glazing Architectural Consulting — 2015-Present
'Just Save Birds' - Founder; Individualized consultation and educational curriculums for a broad range of clients, including prominent glass manufacturers and architectural firms such as Viracon, Guardian Glass, Walker Glass, Studio Gang, Kohn Pederson Fox, and others. Services include project risk assessments (location, exterior glass, lighting, and landscaping to contextualize bird collisions), product recommendations (considering aesthetics, energy performance, occupant comfort, cost, and even embodied carbon), along with code interpretation and fact checking threat factor for patterns/materials.

Glass Collision Research — 2003-Present
Cities like Denver and Seattle, and college campuses across the country are often looking to start collision monitoring programs; I help them develop study protocols, assist with data interpretation and analysis, case study comparisons, and referrals to specialists as necessary. Every location faces different challenges, so customized protocols are critical for useful results. I have mentored numerous student groups across North America, assisted with curriculum development, and presented bird safe design guest lectures at dozens of institutions including Penn State, Iowa State, Lawrence Tech, and SUNY.

Projects:

Superior Township Library, Ypsilanti, MI
MI High Desert Museum, Bend, OR
Penn State University, State College, PA
Iowa State University, Ames, IA
Chicago State University, Chicago, IL
Glass City Metropark, Toledo, OH
Rio Salado Audubon Center, Phoenix, AZ
OH Denali National Park, AK
Baldwin Public Library, Birmingham,
Carle Museum, Amherst, MA
University of Western Ontario, London, ON
Johnson City Comm. College, Overland Park, KS
Bowling Green State Univ., Bowling Green, OH
Seven Ponds Nature Center, Dryden, MI
Black Swamp Bird Observatory, Oak Harbor,
Zion National Park, UT

Advocacy:

- Black Swamp Bird Observatory 2018-present - Conservation Committee member, advisor for wind farm bird and bat impacts, glass collision deterrents, and 'lights out' collision monitoring.
- Bird Center of Michigan 2017-2022 - Board member, collision rehabilitation protocol advisor, collision prevention advisor, social media/marketing review.
- Detroit Audubon 2016-2020 - Board member, and committee chair for Safe Passage program.
- Washtenaw Safe Passage 2015-present - Regional Coordinator for Ypsilanti, establishing monitoring protocols, routes, volunteer recruitment and training, data management and analysis, and outreach.

Publications, Presentations & Press

- *Bird Safe Glazing: What Architects Need to Know*, Facades+ Chicago, 2023
- *Collision Symposium,* Co-Coordinator, American Ornithological Society, 2023
- *Summary of Neotropical Migrants Impacted by Low-rise Non-residential Buildings in SE Michigan*, Neotropical Ornithological Society, Costa Rica, 2019
- *Birds are Disappearing*, op ed, Detroit Free Press, 2019
- *Empty Skies*, Washtenaw Community College Film Studio, 2019
- *The Fight for Flight*, Fauna Creative, 2018
- *Bird Strikes at Windows in Eastern Washtenaw County, MI: A Preliminary Assessment*, State of the Strait Conference, Detroit, 2017
- *Crashless Course: Avoiding Bird Collisions*, American Birding Association, 2016
- *Bird Density and Mortality at Windows,* second author, Wilson Journal of Ornithology, 2008