

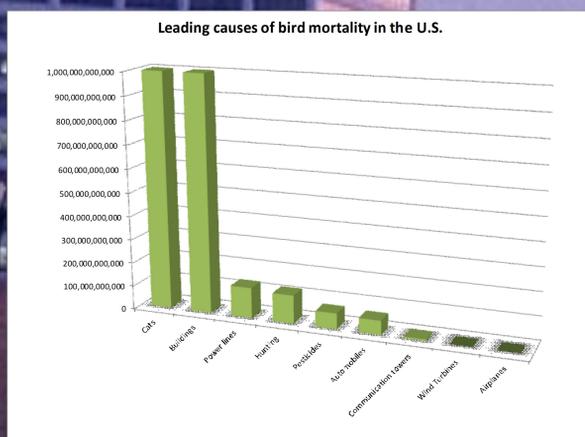
# Bird Down: An analysis of bird-safe building in Minnesota's Twin Cities.



Environmental Studies 395: Senior Research Seminar  
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## Abstract

Anthropogenic causes kill around 3 billion individual birds a year. With windows and other built environments contributing to a third of these deaths, it is important to address how bird-window collisions can be mitigated. I conducted a literature review, and interviewed experts on the topic of bird-window collisions to establish the current state of research, tried and potential solutions, and resistance to bird-safe solutions. There are many strategies used to mitigate collisions such as window decals, bio-mimicry, window films, and external add-ons but the current most effective is UV reflective solutions. I conclude that i) the most effective solutions are infeasible and because of low demand and ii) the most feasible are aesthetically displeasing. There needs to be more research by window manufacturers, more demand from builders and developers, and ultimately more education on the built environment's impact on bird populations.



(Hotz 2012)

## How buildings today kill and confuse birds

Architectural development today embraces high performance and sustainable designs. Often this concept incorporates the natural environment into the structure itself and such designs often confuse birds in flight. Bird-building collisions and mortality are most commonly attributed to two causes – building material and building location. The following effects are some of the causes frequently attributed to bird-window collisions.

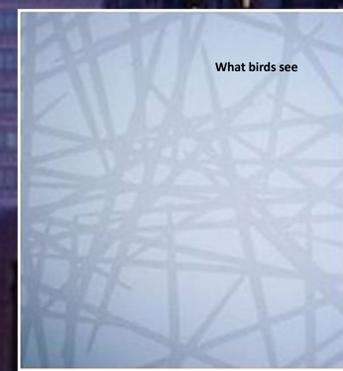
- Mirror effect- reflectivity of the window or building material creating a perceived habitat.
- Illuminated atrium- highlights plants and water features within the building, which are appealing to birds on their migratory routes in search of food and water.
- Beacon effect- Spotlights, aircraft warning lights, and illuminated spaces at the tops of buildings create a “sky glow.” Birds, exhausted from flight, become disoriented in the beams of sky glow and collide with the building. (hazard is increased when fog or humidity is present).
- Apparent flythrough areas- Skyways, glass walkways, and bus stops birds easily see the vegetation and sky on the other side of the built environment and attempt to fly through to it. This hazard is especially prevalent in the Twin Cities.



Example of highly reflective building material creating a perceived habitat. (Eckles 2011)



Potential Solutions	How it works?	Unsolved problems
Dimming the skyline	Many species of birds migrate at night and turning off the lights of buildings during this time both save energy and money while not drawing birds into city centers.	Does not address daytime collisions, reduces company-advertising time.
Visual noise (i.e. window decals, films, Feather Guard, shades, silk-screens)	Deters small birds if placed correctly (10 cm apart) by making the windows appear solid.	Obstructs aesthetics, predator decals actually attract territorial birds, and typically decals are spaced incorrectly.
Exterior shading devices (i.e. tilted, fritted or etched windows and light shelves)	Reduce reflectivity and apparent fly-through and also reduce solar gain and glare.	Etching and fritting are typically done on inside of glass to reduce aesthetic disruption however this reduces effectiveness.
UV reflecting/absorbing glass (bio-mimicry)	Uses UV reflecting/absorbing materials to create strong patterns in glass manufacturing- the pattern is invisible to humans but appears solid to birds.	Expensive and thus low demand and little research to make more affordable.



One solution: “Ornilux” by Arnold Glas uses bio-mimicry to deter birds from colliding. (Arnold Glas 2012)

## Conclusion

The solution to this issue is interdisciplinary and it will require a dialogue between ornithologists, architects, developers, citizens, and glass manufacturers. Research is happening, but demand is low for bird-safe glass likely because developers and architects are not educated on the issue. Creating bird-safe cities is dependent upon educating and communication to build demand. Conserving bird populations is a complex issue and does not have one solution because there is not just one cause. What we do know is that we can work bird-safe concepts into green building and when we do this we can further understand the impacts we are carelessly having. Birds are an important aspect of our world, as seed distributors, rodent and insect population control, and are also a food source for some wildlife. Inter-departmental communication between ornithologists and those involved in construction during new builds and renovations is needed to share information, promote projects, and understand the issue of bird-window collisions will create change.