

Light-Based Multi- Year
Artwork Plan for
Broward Cultural Divison
Broward County Florida

Dan Corson

August 24, 2006



Contents

Introduction

Taxonomy of Light Based Artworks

Daytime Art Expressions

- Dematerialially focused projects

- Materially focused projects

Nighttime Light Based Artworks

- Dematerialially focused projects

- Materially focused projects

Life Span of Artworks

- Permanent

- Short-Term Temporary

- Long-Term Temporary

- Serial Permanence

 - Case Study in Serial Permanence

- Extending the life of Electric Based Projects

- Extending the life of Video Based Projects

- Aesthetic Overload

Project concepts and associated sites

- Bridge Sky Markings

- Siren's Call:

- Sky Canal:

- Marking the Air, Touching the Ground:

- Whirling Dervish

- Stitching the River

- Soft Video / Hard Wall

- Mangrove Cascade

- Transient Video Projections:

- Walls of Light

- Reflections under a Bridge

- Shadowplay in the Sunshine

- Linkage markers

- Light Waves

- Bodies of Light

Budget Recommendations

Conclusions

Moonlight is sculpture.

~Nathaniel Hawthorne

Science is spectral analysis. Art is light synthesis.

~Karl Kraus

The Light-Based Artwork Multi-year Plan was developed in order to provide a range of conceptual directions, locations, suggest a variety of light emitting sources and to provide inspiration to Broward County's Cultural Division as they look to commissioning light-based projects in the future.

The scope of this study was to explore how light-based artworks could fit within Broward County's urban and natural landscape, and how light could be used as a unifying artistic element, bringing both visibility, civic pride and initiating cross-neighborhood cultural tourism to different parts of Broward County.

In creating this study, I briefly delve into some of the reasons why as humans we respond to light and highlight some of the earliest light art experiments categorized as "Luminism".

I also go into a detailed categorization of light based artworks in order to demonstrate the range of forms and the physics behind them as well as to help the selection committee understand how to think about the way a proposed work might fit into their urban environment. Is it better to have a work that is seen both in the daytime and nighttime? If this is the case, what types of work would this mean? If the committee wanted to see only dematerialized artworks that can be seen in the nighttime, what conditions are required for the best display of these non-objects?

I also will touch on the realities of light based work and how that relates to maintenance, changing/upgrading technology and long-term conservation. Sidebars will touch on some positive and negative (+/-) aspects of light projects of each category.

At the end of the report, there is a description of a variety of projects based on these categories and afterwards specific examples of how these types of projects could be realized giving locations, concepts and initial budget ranges for these sorts of projects.

"I will love the light for it shows me the way, yet I will endure
the darkness because it shows me the stars."

~Og Mandino essayist and psychologist

The physics of light and the biology of human perception allows for us to see and experience light in a variety of ways. Living in the Pacific Northwest and being witness to and personally experiencing the dramatic effects of light on the body (both physiologically and psychologically) I can tell you first hand that light provides a keenly visceral experience that can be directly translated into art.

The phototropic effect of sunlight on our skin helps create and synthesize vitamin D. Our body's chemical levels change due to sunlight and help define our circadian rhythms. S.A.D. (Seasonal Affective Disorder) is a very present issue in Northern hemispheres that have few hours of sunlight in the winter months. Our primitive ancestral origins have hard-wired into our brain-stem the most elemental reactions to light. We are drawn to flame (due to the illumination, movement and color). The primitive rods in our eyes are used to see shape and movement in the dark of night. And of course all color, form and motion is visually perceived through light.

Light as a specific art medium can be traced back as early as 1734 when Father Louis Bertrand Castel demonstrated, to a small group of friends gathered in his Paris study, his 'clavessin oculair', the world's first color organ marking the advent of Luminism.* Of course we can look back even further to the Neolithic times when we see light being used to chart the celestial patterns with Stonehenge, Newgrange or later in Chichén Itzá, but these expressions of sculpting light were more culturally symbolic and religious in nature. The major movement of creating contemporary light-focused artwork however began in the 1970's when the boundaries between painting and sculpture began to dissolve, minimalism was fresh and the use of plastics, resins and glass allowed for deeper explorations in transparency and light.



* Jan Butterfield, The Art of Light and Space (Abbeville Modern Art Movements 1993) p 13

Before I give specific examples of potential projects and areas for artwork, I would like to explain some ways of looking at and categorizing light-based artwork. I believe that with this information, Broward County will have a more educated perspective on the range of art work available, as well as have reasonable expectations based on the physics of light.

In general, I will be limiting my observations in this document to artwork that remains outdoors within the public sector. Indoor lighting projects have considerably fewer restrictions due to significantly lower ambient light levels, controllable surfaces, background environments, weatherability and maintenance accessibility issues. So although many of my categorizations of projects may pertain to indoor projects, this study is particularly focused on outdoor Light-Based Artwork.

Looking at cataloging the different methodologies of creating light-based public artwork can naturally fall within two distinct categories. *Dematerially Focused* or *Materially Focused*. Quite simply, is what we are looking at the essence or effect of light upon the world, or are we looking at a container emitting light. Both categories of projects have positive and negative attributes, and I believe that both types of projects are well suited to Broward County.

I will first explore the methodologies of creating Light-based artworks in the daytime, then will expand these categories by showing how they can be applied to evening focused works. Both of these daytime categories display art upon a surface (as opposed to showing light beams in the air).

The tantalizing thing is not always the source of light,
but the effect of light.

~Edward Degas

Light is not so much something that reveals,
as it is itself the revelation.

~James Turrell

DAYTIME LIGHT ART EXPRESSIONS

Dematerialially focused projects:

How can you see light in the sunshine? The nature of most human-made light emitting sources is not strong enough to be seen outdoors in the daytime due to the dazzling intensity of our sun. The sun outshines all, but itself. If there is a strong desire to have a light piece that is seen in the daytime there are 2 basic ways to accomplish this direction.

"There are two ways of spreading light, to be the candle or
the mirror that reflects it."

~Edith Wharton

The invisible made visible.

The first method harnesses the energy of the sun and reflects it back into an area or surface in the shade. Mirrors, lenses, refractive films, holographs, prisms, heliotropes, stained glass, dichroic glass, fiber optics and other optically magnifying and re-directing materials can be used to illuminate objects or spaces. Often the spaces to illuminate or having the artistic effects created in them need to be shaded and be more "controlled spaces" as the effects during the daytime can be subtle depending on the nature of the space and the intensity of the light.

When describing the nature of a "controlled space" I recommend a more neutral, non-visually busy place, that can allow the nature of the light play to be experienced on existing or created surfaces of a light-colored and monochromatic palette. Concrete or light-colored painted surfaces in the shade can provide an excellent backdrop for projects of this nature. Obviously a thorough exploration of solar patterns would be required to create a successful project of this nature.

Due to the biology of human vision, one additional way to allow for a more easily visible reflective project is to incorporate movement into the artwork. Our eyes track movement and light, so combined together they become a powerful lure for the eyes. Motors or naturally initiated movements (wind,

+ /- Kinetic projects always have more ongoing maintenance costs associated with them. They often attract more attention, but also require more upkeep. Within Broward County where hurricanes are an annual occurrence, kinetic projects need to be over-engineered and often do not allow for the elegance or grace of a project designed for a non-hurricane region.

water etc) can direct the reflecting source of the light and thereby heighten its effect within a shadowed area.

Utilizing refractive films allows for a more easily sited artwork because the object itself covered in the refractive film becomes a prismatic object, and needs to be sited in the sunlight rather than projecting the prismatic effect into a darkened space.

Broward County already has a refractive film sculpture by Dale Eldred (Solar Time Plane, 1986) in its collection and due to the highly identifiable nature of defraction grating, I would suggest to rank acquisition of another piece of this nature lower on your desire list.

+/- Maintenance issues: over time, the atmosphere will etch the holographic or refractive film, causing the spectral effect to diminish. Reapplying the film becomes a conservation requirement for this type of project

Shadowplay

The opportunity to work with the absence of light is an additional way to approach a daytime viewable, dematerially focused artwork. Building off the tradition of sundials, creating shadow projections in sunlight can alter the patterns on a wall, building or ground and create a radically different look from hour to hour. Surprising effects can be created by studying the movement of the sun and the interplay of shadow upon a surface or ground. A neutral surface is often the most effective receiving [projection] surface for these shadow projections. Blank walls are preferable to walls with many windows. 2 or 3 dimensional sculpture can also be created that is specifically designed to cast shadows onto the ground, and has a long and rich [Neolithic] tradition.

+/- These projects can have both a daytime and nighttime component depending on evening light sources and proper placement. They can also have the attribute of being both an object or a collection of objects that can be seen as such when the days are cloudy.

MATERIALLY FOCUSED ARTWORKS:

The sculptural form illuminated.

The second way to allow for a light-based piece to be seen in the daytime is to create an object that would capture and then emit light. Like a lantern, the object in the daytime would allow light to pass through the sculpture and scatter the light, giving the appearance of a lantern backlit by the sun. The object would need to be made of a translucent material that would be able to capture the sunlight in the daytime, and allow for the diffusion of a light source in the evening hours. An alternate scenario would be for the sculptural object to be created from a perforated metal that could also be illuminated from the inside still creating a lantern-like effect.

+/- Within this category you need to deal with an object that can withstand hurricanes and yet still be translucent. Challenging but not impossible. Material strength and light translucency tests are highly recommended. Also objects that glow can provide an alluring surface for tagging and back-lit graffiti.

The translucent object can be illuminated by a variety of sources that either project light onto the inside surface in a beam - utilizing traditional light sources like spotlights, flood lights, metal halide lamps or LEDs, or through a non point-source fixture like neon, cold cathode tubes, strip LEDs, fluorescent tubes, fiber optics etc.

Within this sculptural forms category, I also would include large LED outdoor displays and Plasma TVs/monitors. (Objects within space that emit light.) Giant display billboards usually are too expensive to be dedicated to artwork, however interesting time-share alternates to blinking time and temperature have been successfully tested in other locations. (The reason time and temperature are often shown is that media tests demonstrate that people will specifically look to those displays that show time/temp more than others with just advertising.) One successful example of this time-share system is located in Times Square in NYC. The public art group Creative Time has transformed an iconic billboard into a changeable artwork venue entitled the 59th Minute. For the last minute every hour an artist has one minute to create an artwork utilizing the giant LED display as their canvas.

NIGHTTIME LIGHT ART EXPRESSIONS

DEMATERIALLY FOCUSED PROJECTS

This category is where most people imagine Light based projects. This category gets additionally subdivided into two categories:

Thick Air and Upon a Surface:

Thick Air:

Lighting projections of any type need to scatter light upon a surface (even if it is normally invisible) and have that light bounced back into our eyes. Even with lasers and searchlights, the light still hits invisible airborne particulates and scatters the light waves back into our eyes. This category includes Projections (into air, water, steam, smoke, co2 fog, water sprays etc), Lasers (in the air or onto water, steam, water sprays, smoke), Searchlights, Aircraft Landing Lights. In this category the artwork may be static or kinetic. The light shaft **is** the expression of the artwork. The light can be a terminated beam (stops at a building or ground) or unterminated beam (projecting into the sky) or series of beams of light that marks space (and sometimes choreography) within the black void of the sky.

Upon a Surface

Here the light source strikes a surface and the reflecting light bounces back into our eyes. Examples of this category include Projections (onto buildings, trees, people, boats etc) Lasers (onto buildings, lawn, rooftops), Searchlights (focused onto the ground, a building, an object), gobos (theatrical shadow projectors), Theatrical Effects Projectors, static slide projections, film, Digital Projection systems, LED surface projections, [UV] black lights and any other non object-oriented, light-based, reflected phenomenological art experience.

+/- These projects can usually be seen from a long distance away and can be quite successful at attracting people and identifying geographical locations from a great distance. Atmospheric conditions change locally day-to-day and hour-to-hour. Sometimes light beams can be easily seen, sometimes they can be close to invisible. Often these types of projects work best for short events or temporary installations. Re-lamping and electrical running costs are usually expensive (the brighter the source, the more electricity it takes to run it.) In order to heighten the effect of the light beams, smoke or haze is often introduced into the area. This is another reason why these projects often work best for temporary events.

LOCATION LOCATION LOCATION

+/- These types of **dematerially focused projects** demand a very careful placement within the urban environment. The environmental Ambient Lighting Levels (street lights, pedestrian lights, shop lighting, billboards etc) of a site dramatically affect our perception of the projected artwork light. The artwork needs to be tested to see that it is bright enough under the exact conditions it will eventually be shown under. Dimmer ambient lighting conditions are generally more favorable to dematerially focused projects.

Besides ambient lighting conditions, the key viewing “background” of the site is especially important for dematerially focused light projects. Depending on local and nightly atmospheric conditions, these projects can be somewhat dim to begin with, so having a bright or active background can diminish the effect of the light beams. It is best to provide as neutral and dark a background for these types of projects in order to maximize the artistic effect.

MATERIALLY FOCUSED ARTWORKS:

The sculptural form illuminated.

There are two sub categories under this form, “the lantern” and “ the Light Bulb”. Both classes emit light, but one is the embodiment of the source of illumination.

The Lantern

As in the daytime, this subcategory is viewed like a lantern. A sculptural object is illuminated from within. The skin needs to transmit light. The sculptural form is the focus to the project, and the illumination brings an additional component to the project. The object can be illuminated by a variety of sources that either project light onto the inside surface in a beam-utilizing traditional light source like spotlights, flood lights, metal halide lamps or LEDs, or through non point-source fixtures like neon, cold cathode tubes, strip LEDs, fluorescent tubes, fiber optics etc.



The Light Bulb

This subcategory is identified when the source of the illumination is a key component of the artwork. Projects of this nature are often created using neon, fiber optics, electroluminescent wire (EL wire) light bulbs, strobe lights, flash bulbs, LEDs, glowing material (phosphorescent paint, pavers, glass etc), fire and fireworks.

+/- What does the support material for these projects look like in the daytime? If we see them lit up at night, what "carcass" do we see in the day? How does that (or not) inform or get incorporated into the project?



Entropy by Bill Concannon



EL Wire, Burning Man Festival '01 photo: Thomas Gruber

Permanent Temporary, or Both.

How should projects be classified as permanent or temporary? The committee should take into consideration when projects are seen and under what conditions. Are pedestrian focused projects best seen when people are out, walking around? Are projects viewed by roads and office buildings able to be appreciated all year round? Are on-going annual maintenance costs acceptable for the projects that need to be serviced 4 times a year? What about 8 times a year?

PERMANENT PROJECTS

Permanent Projects (20 yrs+) Projects of this nature are often integrated into new architecture and landscape architecture and become part of the building management's maintenance scope.



TEMPORARY PROJECTS:

Short-term temporary (1 night to 1 week) are often associated with events and celebrations. They provide strong media opportunities, in that they are short-lived and often visually newsworthy. Often projects that cannot be afforded as a permanent project (due to power consumption, equipment costs, outdoor permanence etc.) fit best into this type of category.

Long-term Temporary (1 month-3 months) allows flexibility in that the semi-permanent set up costs can be made from less costly materials, projectors or lighting equipment could be rented, and permanent engineering/attachment to infrastructure is often not required. Often projects within these categories can “push the boundaries” from a conceptual/political nature as well as allow for more experimental material choices that have not been tested for outdoor “permanence.”

Serial Permanence (reoccurring annually) allows for projects to be appreciated during the best months of the year and then put into storage until the following year. You can think of this as the “holiday light” option. Of course projects of this nature need to be designed for annual reassembly and to be broken down for storage. An additional cost associated with this system of course is the yearly storage, assembly, removal and transportation of the projects.

Serial Permanence

There are a few highly visible examples of ongoing collections being built with this type of system in mind. One example would be in Torino Italy. Torino uses the funds that have been normally allocated as city holiday street lighting, decorating and enhancement to commission contemporary artists to create 3 month permanent art projects viewable for the darkest months of the year. The money for the year is pooled, and one artist is commissioned to create an artwork. The artist chooses the location (street, plaza,

building etc) and develops a project around the site. The contemporary museum curates the project and selects the artists. The projects are on display for 3 months and then put into storage for the following year. In addition to this, the city publishes brochures and maps where to find the artwork as well as providing large scale signage and other multi-lingual information about the work and where other nearby artworks are. This program greatly adds to the tourism of Torino and allows the city to maintain its position as the center of contemporary art in Italy. An English language version of the Torino contemporary art website can be viewed at:
<http://www.comune.torino.it/artecultura/luciantista/>



There are two kinds of light - the glow that
illuminates, and the glare that obscures.

~James Thurber

REALITY CHECK

Light based projects have ongoing maintenance costs associated with them that are higher than that of traditional sculpture. The proper upkeep of light-based artworks is often a primary importance to the long-range success of a project. Allocation for new lamps, spare parts, electricity and the staff to do the maintenance needs to be factored into the long-range plan of any light-based public artwork.

Extending the life of Electric Based Projects

Where projects are discrete and seen from an isolated area, I suggest the use of motion sensors and timers to increase the lifespan and environmental awareness of projects. When there is no one to view the project does it make sense to shorten the lamp life and waste the electricity when it is not being appreciated? Many sources are now designed to work under short duty cycles and do not decrease lamp life expectancy by turning on and off the lighting source.

Additionally, by slightly under-powering the lighting sources, it is often possible to add an additional 25% to the life span of the lighting source. Besides saving electricity, there is often significant savings in maintenance by under-powering lamps. Of course a balance needs to be struck so that the optimal illumination level is still seen in order to present the project in the intended conditions.

Another often-overlooked issue is what happens when a light or projector burns out? Who tells the custodial agent that the lamp is dead? Often the public will not know if a project is intentionally off-line or if it is dead, or for that matter, who to contact if they notice it is out. Periodic “drive-by” evening inspections should be done twice a month to verify systems are operational. Noting that there is a privately employed security guard who patrols the parks and DDA properties, an additional service that they could be contracted to provide would be to report outages to the appropriate agency.

Partnership with organizations, public and private agencies who will maintain projects are often a successful way for underwriting a project. Especially good are those agencies that already maintain physical structures, as they are already set up to do this sort of preservation.

A special note on video projection artworks

Video projectors are complex by nature and have many specialty components that are optimized for traditional viewing conditions. One of the peculiarities of video projectors is that if a lamp does not light up, then it will try to re-ignite the lamp over and over again. Obviously a dead lamp will not ignite, but the projector does not know this. The

projector will continuously try to re-start the dead light finally burning out the ignition device (power supply) that is often quite costly to replace. If you were viewing the artwork in the theatre, a "CHANGE LAMP" message would appear on the screen. Who would see this in a public artwork? There is now specific software that was developed to send an email or text message if the lamp dies or is in need of replacement. I strongly suggest that this type of system is integrated into any video projection system.

Awareness of an aesthetic overload

We are all aware of the exuberant chaos that defines Las Vegas in the evening: Blinking lights, flashing neon, frenetic video clips on giant bright video displays. Light can be over stimulating sometimes. This proposal list is not designed to have every project realized. It is to begin a conversation and provide background and information as to what kind of lighting projects can be done and the best conditions for them. You will see a number of projects recommended for bridges here. Some of them are in conflict with each other. You will not want to do 3 lighting projects on one bridge for example. I hope that as the committee looks at this in the future, that the overall balance of nighttime lighting will also be considered.

The following is a series of examples of project concepts and sites. These can be used as conceptual frameworks to demonstrate a type of project utilizing various types of light for crafting individual calls-to-artists. Of course each artist needs to put their unique stamp on their project and may look at these locations or types of projects as "jump off points." Each section notates the type of project, a location or type of location, a conceptual approach for this type of project. Budget ranges are discussed at the end of the study.

PROJECT CONCEPTS AND ASSOCIATED SITES



Bridge Sky Markings

(an example of a Dematerially Focused project in "thick air".)

Due to the flat topography of Broward County, the marking of space with light can not only contribute to a successful art piece, but also help in spatial orientation and transportation patterns. There are a number of draw bridges in Ft Lauderdale, and the ability to mark the sky with light while the bridges are up can be a way to help define the skyline and provide a real-time spatial understanding of traffic patterns in the city at night. Mounting powerful searchlights on either side of the opening drawbridges allows for an ongoing celebration of the bridges openings. As the bridges begin to move, the lights will turn on and sweep the sky with the arching of the bridge. The lights turn off when the bridge is back in its resting position. • **Locations:** Drawbridges in Broward County, especially the Railroad Bridge.

Permanent